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THE PIANIST'S MECHANISM

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THE PIANIST'S MECHANISM

A GUIDE

To the Production and Transmission
of Power in Playing

By

ABBY WHITESIDE

Drawings by
MARTHA EATON

G. SCHIRMER
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PRELUDE

The circumstance that for several years I have been engaged in teaching in New York City during the winter, and in Los Angeles and Portland during the summer, has given me the opportunity to hear students from all over the country play the piano. Their technical equipment is appallingly unlike the mastery of the big men in the field. This is particularly true of the women.

What is it that makes it possible for the outstanding men in the piano field to play with such total lack of effort?

My own inability, for years, to get adequate results from the teaching of gifted students compelled me to ask this question again and again, and finally moved in me a determination to find out the exact answer for myself. I found the clue to the secret of their ease—simplicity in motor patterns—almost immediately, but it took me eight years to work out a simplicity in the teaching process that would produce their simplicity in playing. The results that then appeared were highly gratifying.

Since the faults that blocked achievement for myself technically are apt to be the same for many women, because of strain in producing power, I feel this little book may be of special value to women, while its principles will apply equally to men.

It is with the hope of breaking through the traditions in teaching the piano which have come down to us and which have not produced any uniform results, and of helping the multitude of earnest students seeking a means of free expression in the piano, that I have written this study, which sets forth the procedure I have now employed for a number of years in my teaching—a procedure that I believe is in accordance with the modern virtuoso's astounding ease, speed and beauty of tone.

TO MY STUDENTS

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CONTENTS

PAGE

PRELUDE iii

CHAPTERS:

I. WHAT IS WRONG WITH THE PIANO FIELD? 1

II. HINDRANCES TO BE DISCARDED 9

III. AN ANALYSIS OF THE PLAYING MECHANISM 18

IV. THE THUMB 29

V. THE TEACHER'S TECHNIQUE OF TEACHING 38

VI. ILLUSTRATIONS FROM MY TEACHING EXPERIENCE 52

CONCLUSION 57

LIST OF ILLUSTRATIONS

		FACING PAGE
1.	Folding the forearm out of the way	19
2.	Position when using fist and finger alternately	25
3.	Hand position in equalizing the length of the three middle fingers to the length of the straight thumb and little finger	26
4.	Exaggerated defect in thumb extension	31
5.	Tip of thumb flexed to avoid action while first segment is put through all its movements	32
6.	The distance that the thumb can be passed under the palm without sacrificing the straight line and the free first joint	33
7.	Showing that the larger part of the flexion takes place at the second and third joints when the thumb is passed under the palm	33
8.	Adjustment at the shoulder to make it possible for the thumb to connect in passing without losing the elements necessary to secure the reaction	34
9.	Position for forcing the thumb away from the palm	36
10.	Position for direct pressure from the shoulder against the teacher's hand in order to force action at the elbow	41
11.	Position for forcing thumb extension	42
12.	Right finger-line with extreme extension	44
13.	Faulty finger-line which is often a result when establishing extreme extension	44

THE PIANIST'S MECHANISM

CHAPTER I

What is Wrong With the Piano Field?

In the opinion of modern educators results, both in accomplishment and in forming habits of concentration and industry, are more efficiently attained when the student works because of enthusiasm for his task, rather than because of conformity to discipline.

There is a lamentably small ratio of successes in the piano field in proportion to the number of talented boys and girls found in the studios throughout the country. There should be a high average of attainment for these intelligent and gifted students. But isn't it true that you, for example, know a number of boys playing jazz—"they just picked it up by ear"—who have more real facility than the clever student who has had the usual routine of finger-drill?

Learning to play the piano must be learning to handle difficulties easily or the results will never be the mastery that can ignore difficulties. It is as easy to distinguish between the player who plays with handicaps and the player who knows no obstacles, as it is to distinguish between the runner who makes headway with effort and the graceful being who skims the ground as though his body had no weight and every contact with the earth sent him forward.

The piano is less popular with concert audiences than either the voice or the violin, and certainly that fact is not due to its literature, for nowhere else does one find greater wealth and variety. It is hardly possible that the piano has less capacity for producing rhythm and melody, the two great appealing elements in music. Is it not rather owing to the lack of simplicity in presenting them that their beauty is lost to the listener? Perhaps, in spite of the general opinion, the piano is less skillfully used than either the voice or violin as a medium for emotional expression.

Many problems arise because people differ so widely in their ideals. What is the most beautiful production to one may not

be the most desirable to another. We observe that people are prone to love the thing to which they are accustomed—their own piano usually has a "sweet tone." The artist whom they have heard most frequently, perhaps because of his personality, is the one who most delights them. The list of players from which to choose models for production is fairly long. To insure a clear understanding of the mechanism under discussion, two names will suffice—Rachmaninoff and Lhévinne. Each is a distinct personality, with a technical equipment which allows full range in speed and dynamics, without effort and always with beautiful tone quality. I use the word "quality" with the connotation that is habitual with most listeners. In this sense it includes both the tone produced and the accompanying mechanical noises of the instrument. These noises of percussion largely determine the meaning of "touch" to most people. In reality the tone of the piano is only changed by the intensity of the application of power; but since the amount of the noise of percussion is an aid in determining whether power is applied with waste I have used "quality" to include this noise.

Some of the artists with the richest creative capacity now before the public have technically never achieved absolute freedom. The very fact that there is such a wealth of emotion to express, perhaps, has interfered with the perfecting of their mechanism. Everyone, at times, has heard too much power applied by the supremely great under the stress of surging beauty. It is a giant task to keep the reins always in hand.

One of the reasons why the mechanism of the great players is so little understood is the fact that the desire for beauty has led them into paths where they have almost subconsciously blazed their own trail. The goal of a perfect tone quality has made such demands that their ability has measured up to it, not so much because of the teaching they underwent, as because of inner drives. If it were the result of teaching there would be a far better average of technical mastery. Moreover, when we go to them to find out the secret of their perfection, they cannot tell us. They pass on to us the thing they were taught, which in all probability they have discarded because it was inadequate to the demands of simplicity and quality. They have gone down the new path with their ears leading the way, not feeling any need of carefully analyzing the working of their muscles, since they had the ability to

adapt them to all their needs. A gifted teacher of literature once said to me, "Few people create in two fields, and teaching and playing are both creative fields." When the artist, through years of devotion, has given us great beauty, we should not be surprised if he cannot tell us the road he has traveled to reach perfection. But too often we have expected him to do just that, and thus the field of teaching has failed to find his simple muscular adjustment.

We perfect the thing we use. If our tools are unlike the artist's, our results will also be unlike his. Most pianists put in years practicing with utmost care the thing a respected teacher tells them, believing that by some miracle, some day, they will find themselves provided with the equipment of the master, even though they have never been able to analyze his playing. Unless there is definite daily progress in practicing in the direction of quality and ease, accompanied by the conviction that the mastery of the artist is just further along on the same path, but within hailing distance, there is every reason to believe that we are lost in the woods and going around in a circle, never getting on the main trail that leads into the high road.

"Practicing incorrectly simply perfects the mistakes," says Leopold Auer. That saying is well worth heeding. The student might better be playing golf with a free bodily swing than be sitting at the piano doing the wrong thing muscularly.

When the student is right in muscular adjustment the playing of the artist is no longer a miracle—the gift of the gods. It becomes a thing that can be clearly analyzed, and then we may expect results to grow definitely in accord with the amount of time put in at the keyboard. Nothing is so stimulating in the formative years of work as the consciousness of ability to achieve what is desired, and nothing is so discouraging as continued frustration in expressing the response created by listening to beautiful playing. Is technique, the perfect mechanism, only a means to an end, or, as I firmly believe, is it a creative factor in aiding emotional development? Take the case of the gifted player who, in spite of waste action in production, has accuracy and speed in the most difficult piano literature. There are a number of such players before the public. Is great simplicity ever the outstanding characteristic of their personality—that simplicity which is the charm of the truly great in every field of artistic expression? I have observed, as the

result of eliminating waste together with the strain it causes, what seemed to be an immediate gain in simplicity in interpretation. Of course, the capacity for just that response was always present in the player, but it could never become the basic reason for dynamics and phrasing as long as he had no intimate knowledge of its means of production. Again, when a player must choose for his repertoire, literature which avoids the demands to which he is not equal—octaves are frequently such an obstruction—perhaps just the beauty of one of the concertos making this demand might have created a new response which would have generated a greater richness in his emotional coloring. It is not unusual to hear a student express a great desire to play a certain composition which has thrilled him. When that desire is always thwarted some joy is lost to him. The growth in creative power is not so simple that one can easily determine what damage has been done when there is no opportunity for freedom in choosing a thing of appealing beauty.

Perhaps we have yet to learn the full emotional possibilities of women in the playing of the piano, for almost from their earliest efforts there has been restriction of full expression because there has been no easy flow of power. The highest compliment paid to a woman player is, "She plays like a man." That means a sturdy quality and ease. It means that the listener can sit back and be comfortable, knowing that all the difficulties are going to disappear. Few women pianists give the listener that feeling of pure joy unmixed with anxiety, so few indeed that they might quite well be an accident, and not the result of a clear understanding of the mechanism. No one can play professionally if unable to play without blurring and wrong notes. Accuracy is demanded. Therefore, if the woman has not sufficient speed and power for building the climaxes desired, she makes the adjustment necessary, both in speed and dynamics, to insure accuracy. This disturbing adjustment is too commonly a part of the playing of women not to have been felt by their audience many times.

If ease, not accuracy and speed, were always the first requirement, and if it were always demanded, many of the common faults in piano playing would not appear; for, where there is talent and industry, accuracy and speed naturally result when there is ease in production. It is a beautiful tone, a lovely melody, an alluring rhythm, a range of dynamics and simplicity that charm; and all of these are to be achieved only when power is wielded

without strain and waste. Even when the innate response to rhythm is very strong it cannot be projected to the audience unless tone is being produced with a steady, balanced current of power. Accents may be right and time-spacing absolutely correct, but there will be no lilting, infectious rhythm. If you pick out every player before the public, in the orchestras or in the recital halls, and list those whose rhythm is an outstanding quality in their playing, you will find that in every instance tone is produced by a balanced, flowing power, not by a power that begins and ends with single notes or that is at all constricted.

A reason for stressing quality in teaching technique is the necessity of training students to listen entirely with their ears. Usually they demand to see what is happening, and eyes are often very misleading, for the greater the mastery of the player the less there is to see of his manipulation of power, and movements that are apparent enough to be copied, as a rule, belong to unskilled labor. One should believe only what one hears. Be sure that that hearing is trained only by long association with the quality of the artist.

Nothing matters so much as quality. If there is to be beauty ultimately, there should be beauty from the beginning. A lovely, full tone is the result of constantly using a full tone, and not of playing half the time with the power from the upper arm off, as is true of much so-called finger technique. It is almost trite to say that for any sustained effort the energy used should come from the greatest reservoir of power, and for piano-playing that means from the large muscles controlling the arm. Everyone knows this and admits it. Then why are results not in accord with this simple dictum? It is simply because fingers are trained to hit, and the action is so thoroughly learned that they never stop doing it; and just so surely as the tone-producing action comes mostly from the small muscles controlling the hand, there will never be complete control of the energy for playing in the large muscles.

Most of the failures among piano-players are due to the lack of understanding that the power from the arm plays against a firm finger and reacts at the knuckle. This subject will be developed later in this study. The technique of the hand—its function—is that of transmitting to the key the energy directed by the large muscles, not that of producing the power. The demands in the mechanism for transmission are very different from the demands

for production. It is not reasonable to train for one in order to acquire skill in the other. It is like training for the high jump when the desire is to be a long-distance runner.

There are a multitude of disappointed gifted girls in the piano field whose experience is so alike that the story of one would fit almost all of them. There are the early years of rapid progress in finger facility, and great enthusiasm and joy in the lessons. Then the literature begins to make demands for greater climaxes and there is the effort to secure more tone. Progress begins to slow down, and the contrast between the rate of achievement and the time expended creates doubt as to whether there really ever was as much ability to play as the student was led to believe at the beginning. A plane of skill is reached beyond which there seems no hope for further attainment. At this point there is not sufficient equipment to give ease in interpreting much of the real literature. The chance for success under these conditions is slight. The student thinks her way through to this conclusion, faces the facts, and decides that the artist's ability for acquiring technique is of an entirely different sort from hers. She may have played a very creditable recital at the time of her greatest effort, but a few years later the story is, "Oh, I never play any more. I am entirely out of practice. I never touch the piano." Would that happen if playing had continued to be easy and delightful?

Note the type of player, even the young player, who is always ready to play and has a good time doing it. He has a mechanism in ease akin to that of the artist. There are the players who say that if they are away from the piano three days all their friends can detect it. Then there are those who say that they practice very little. Even when both are in the finest condition it is not very difficult to classify players as belonging to these groups. The first group never plays with the abandon of the second. Its members have gained accuracy and speed with great effort at the cost of strain in their mechanism, and their playing is not uniformly lovely. There may be sections of great beauty because there is the spirit and desire of the artist; but there will also be sections where effort is apparent and the message suffers. Those belonging to the second group toss off technical difficulties with never a care for distance and speed, and because of this lack of effort their facility remains even when they do not practice daily. They have created a river-bed with a free channel for emotional expression,

and there the power courses along without effort or waste; and since there is no strain connected with their playing, power is used in much the same manner in many of their other daily activities. Progress toward perfection continues, even during a vacation from the keyboard. This has been frequently observed by students. They have returned to the piano after several weeks of absorption in other duties or pleasures to find an increase in facility. William James has said that we learn to swim in the winter and skate in the summer. Once a simple muscular adjustment has been made, and the obstruction due to strain is lacking, the mechanism goes on being perfected. But when a mechanism has been brought to a degree of perfection to the accompaniment of strain, a vacation proves a disintegrating process and the whole structure begins to totter. Insecurity is felt and the joy of playing is taken away, with the natural result that the piano is abandoned as too insistent a taskmaster.

The pianist's problem is to produce a phrase-line that has all the simplicity as well as the grace, balance and charm of the instruments whose tone is produced by a steadily flowing current of breath or the bow. Probably much of the struggle to find simplicity is due to the fact that a fluent finger-technique sufficed for the harpsichord and clavichord. The tradition is still present that if an independent finger-action is developed in Bach most of the difficulties in piano-playing will disappear. But consider the demands of those old instruments. A feather would almost suffice to depress the keys and the scale of dynamics was very limited. In addition, the distance from one end of the keyboard to the other was appreciably shorter than on the keyboard of the piano, so that from the point of view of distance as well as of application of power, the forearm, used from the elbow, was quite equal to all demands. All that is changed in the modern piano, yet in great part we learn to play with the same material and in the same manner.

What would happen if we began with the requirements of our present-day instrument? Just this: at an early stage of his studies the talented student would secure with ease the speed and quality which would no longer be the exclusive acquirements of the so-called prodigy, who by good fortune had progressed in a straight line because his application of power was entirely right from the beginning. Only the right way is ever easy. The fluency of the

boy who plays jazz from the beginning is an example. What he desired demanded chords and octaves all over the keyboard; so technique was acquired with the large muscles instead of with the small ones.

Is it reasonable to expect the master's consummate ease at the piano when the daily routine of practice never glimpses it? One might as well expect perfection in the technique of swimming from daily golf-playing. The mechanism used in daily practice at the piano is not much more nearly related to the actual perfection of the master, in many instances, than are those two sports.

The qualities of the piano that are undesirable for the student to imitate are heard far more frequently than the qualities which make the piano a beautiful medium of expression. That he may guard against wrong impressions, the common faults of much of the piano-playing he is exposed to are listed below:

A separate application of power is used for each tone. This interrupts the flow of the phrase, not in degree but in the same manner, as the sentence would be interrupted by taking a breath between each word.

The power is relaxed and the intensity of the arm is changed after each motive. This ruins the dynamic line of the structure as a whole, and frequently is the cause of strain in fast playing.

The power drives too deep, below the level of the key-bed. This is a waste of energy and tends to break the phrase-line.

The small muscles in the hand and forearm are allowed to furnish part if not all of the energy for tone. The motive energy should always be furnished by the large muscles.

The hand and forearm take the control of placement, of finding the key. There should be lateral finger-spacing for chord-formation in the hand, but the control of lateral progression of the playing mechanism belongs to the shoulder-joint.

Some of the causes of these faults are given in the following chapter.

CHAPTER II

Hindrances to be Discarded

A statement made by a gifted violinist aptly puts the case of most pianists: "We carry around with us so much excess baggage in the form of ideas gathered from teachers who did not know the exact demands for playing, that it takes us until we are forty to get rid of all the incumbrance of this network of inaccuracy that has been placed in our path." This is true, so true that it is often a misfortune for the student to be too serious and too willing to accept advice. Over and over again, as I have listened to superb playing, I have asked myself, "Why should the student allow anyone less skilled than this great master to put his stamp upon his playing?"

What the student needs to gain from the teacher is an adequate mechanism for full emotional expression, and knowledge of the fundamental relation of rhythm and of dynamics to the manner of using power. Even when, because of isolation, there is little opportunity for hearing the true artist, the pupil is better off if he uses his own ideas of interpretation at an early date, and the teacher should keep hands off, except where flagrant bad taste is displayed.

An easy mechanism tends to build a feeling for the flowing phrase and undulating rhythm. Technique is not only a means to an end; it can be a stimulating factor in emotional expression.

Before discussing the specific means of attaining technical skill I want to get rid of ideas that may stand in the way of fresh impressions regarding the use of the muscles in the hand and arm.

These "discards," as I have tentatively named them, are the ones I have met as a student and as a teacher, and which have been stumbling-blocks in the way of easy progress. In some instances skill has been achieved with their use, but they only add one more complication to the mechanism, and the net result is playing which lacks the greatest degree of vitality and simplicity.

To avoid unnecessary repetition, I shall use the word "shoulder" to indicate the shoulder-joint and the muscles acting upon the shoulder.

The Hanging Elbow. What is the desired response when a student is asked to let the elbow hang? Rarely do two teachers

mean the same thing by this advice, and rarely do students respond in the same way. The most frequent result is a top arm inactive because of relaxation at the shoulder. Nothing can be more damaging than this condition. Furthermore, with the attention directed to the elbow as the point to be kept hanging, there is a decided tendency to manipulate the forearm with little reference to the power at the shoulder. It at once becomes more difficult to maintain a vital tone, and, worst of all, so far as ease is concerned, the forearm and hand take up the control of the placement of the hand on the keyboard. When this happens women are doomed. Invariably when control of side to side progression ceases to come from the shoulder, there is definite strain and apparent fatigue in their playing. They are unlovely to listen to and the audience is relieved when their program is over. With men it may be different. They may be handicapped by some faulty muscular adjustment, and still play in such a manner that the listener gets the message without concern as to the effort they may exert. In fact, there is no reaction other than pleasure when there is an alluring emotional quality in their playing. The reason for this lies in the fact that there is plenty of surplus power in a man's physique for piano-playing, so that some of it can be wasted and there still remain a sufficient supply for playing without the effort that distracts attention from the message. A woman's physique is less powerful. Women are adequate to the demands of the piano, especially when they choose the heavier compositions—which, of course, they usually choose—only when the mechanism has every advantage that can be attained by placing the great bulk of all the demands on the large muscles. It is only then that their emotional quality is felt by the audience, and that they do full justice to their conception of the composition, for effort in producing climaxes is distracting to the listener. Instead of a "hanging elbow," the extreme of alertness in carrying the arm is the desirable condition. It is only when the shoulder sets the pace that the whole mechanism is easy. If that could be the most vital and the earliest lesson learned by the student, much time and effort would be saved, and, incidentally, much happiness in practice would be the result.

Weight Relaxation. If every time the phrase "weight relaxation" were used there could be a specific understanding as to exactly what degree of activity is meant by relaxation, and that "weight" in this connection is coupled with the muscle-action

only in a slow tempo, and specifically when resonance is desired, then there would be no occasion to quarrel with the phrase. But when "relaxation" is so frequently interpreted as "lax" or "loose" (the ordinary definitions of "relaxed"), and weight is interpreted as a constant element of the adjustment, the greatest possible hindrances are put in the student's way in respect to acquiring speed with ease. Nothing worth while in speed is accomplished with lax muscles. Observe the Airedale dog as it bounces along the street, or the prancing horse, or the cat running up a tree, or the robin as it hops over the ground, and see whether "weight relaxation" is a thinkable analysis of their muscular adjustment to the requirements for speed. It is animals basking in the sunshine and drowsy with sleep that hint at "weight relaxation." The minute that speed is demanded a quick alertness runs through the entire body. The same holds good of the pianist in his adjustment for speed. A much better phrase than "weight relaxation" can be found for suggesting the activity desired in the playing mechanism.

Rotary Action. This action belongs to the elbow and the forearm, and is the movement with which we turn a door-knob or use a screw-driver. There is no doubt that it is in constant use in the playing mechanism, so why am I listing it among the discards? Because an adequate shoulder-technique insures the full coördination of the rotary action, but the rotary action does not insure an adequate shoulder-technique. On the contrary, it furnishes an excellent loophole for allowing a disconnection at the elbow from the central power at the shoulder—a possibility that should be assiduously avoided. There is sufficient power in the rotary action to allow the shoulder to become inactive, and if that happens, the suspended power for the phrase-line is done away with. Since without the rotary action no power from the shoulder can be applied to the keyboard, with five fingers ready to play, it becomes an automatic adjustment; and it should go without saying that every action that is a by-product of the fundamental use of power had better be left a by-product than trained as a specialty. This makes for simplicity in the finished product, and saves time in the acquisition of facility.

Wrist Octaves. Certainly octaves can be played from the wrist, and are very frequently and often successfully so played by men, but practically never by women. If it is not the easiest way, then it should be forbidden to women, for they always should employ

the manner of power application that insures the least expenditure of energy. Frequenting concert-halls week after week will illustrate this matter beyond the shadow of a doubt. But even for men there is nothing to be gained by playing octaves from the wrist, for speed is equal when they are played from the elbow, and there is more power. Thus, training for this technique at the wrist is a handicap rather than an asset, since it means just one more chance for interference in acquiring the simplest application of power.

Wrist Staccato. A staccato possessing the greatest brilliance and the greatest speed is a most useful possession for beautiful playing. The greatest brilliance is always produced by the power of the triceps muscle, acting upon the elbow in coördination with the shoulder power. The greatest speed is attained when the fingers transmit the arm-power. The wrist staccato is simply another instance of training for an action which is discarded when the heaviest demands in brilliance and speed are made upon the player, so, logically, it is wise never to take a chance of developing a technique which may very easily interfere with the greatest achievement.

Sidewise Adjustment at the Wrist in Scale and Arpeggio Playing. The special training in sidewise placement at the wrist is dangerous for the reason that so many other actions are dangerous; it increases complexity in the mechanism, and the road to simplicity is difficult enough at best. The primary demand upon the wrist is to carry the hand in easy balance as a continuation of the forearm. With this lesson mastered, any slight adjustment of the hand to a full arm-action is made quite naturally. When the shoulder steers the arm into position the wrist will supplement the action without special training, and with the control of sidewise progression localized at the shoulder, and not at the wrist, a better proportion of adjustment is made.

Relaxing the Wrist as the Arm is Lifted from the Keyboard. This discard occurs largely in the playing of women. It may have some relation to the desire to be graceful, but it is chiefly used as a means for relieving strain. It easily becomes what seems to be a mannerism. It is a distinct disadvantage in fast playing because of the rapid return adjustment necessary to a playing position, and it is of no assistance in slow, resonant playing, for it only tends to dissipate that equilibrium throughout the arm which is so highly desirable for beautiful playing.

Pressure Downward at the Wrist. The wrist, of course, is simply a joint, but we habitually use the word to mean the muscles which pass through it to the hand, and I have used it as in common parlance. If the wrist has been actively used as a part of the "pressure touch," it has probably assumed at least some portion of the active tone-producing energy. No woman can afford to let this happen, since strain and fatigue in her mechanism are bound to result. There is an alert quality in the muscles at the wrist which makes the latter equal to any pressure that the arm may put upon it, but the coördination for transmission of power is quite a different matter from the actual production of energy needed for tone. It is highly important that the wrist should remain an open channel through which the power may flow to the hand. To permit the wrist to assume any control of the action for tone is an interference in this transmission.

Wrist Position. There can be no dogmatic statement about whether the wrist should be high or low. The wrist must make compensation for an inadequate span, especially when that inadequacy is in the thumb. If it fulfills the demand of carrying a balanced hand, it may safely be allowed to conform to a position which makes for the greatest ease throughout the hand. This certainly will not be an exaggerated high wrist, but neither will it be a low wrist, unless there is an easy span of a tenth in the hand, or unless the fingers are being used for the production of tone.

The Finger Lift and Hit. The action of the finger may easily become as determining a factor in our pianistic orientation as the little steel switch on the railroad track which allows us to stay on the main track and travel toward our goal, or shunts us off on the side track while the other trains go by.

Little assistance in determining the exact action of the finger is to be gained from watching the artist. In rapid work the eye cannot follow his action, and in slow work he is very apt to employ actions which he could not use in rapid work. This means that he unconsciously allows more play of the muscles when there is no demand for speed. But surely no one will argue that there is any advantage in practicing slowly a passage that is later to be played presto, except to perfect the precise application of power needed for velocity. The chief reason that slow practice is often injurious is that the entire adjustment is more lax, and the application of power is far slower than it should be for speed. Unless the

student can duplicate, in a slow tempo, the action that he uses when momentum is gathered, he is never completely master of his mechanism or, at least, he never could successfully teach anyone else to secure his own results in fast playing. The following fact is always to be observed: when speed is demanded there is little display of movement throughout the hand and arm. Therefore, if we are using a slow tempo to build up a technique for speed, there is every reason why great care should be taken in slow practice to use the exact mechanism which can be carried over into the fastest playing without any change in the action. Of course, if a slow tempo is used for gaining control of resonance, the problem is a different one.

In arriving at a conclusion concerning the action of the finger, the determining factor is ease in producing all brilliance possible with speed. Brilliance means intensity in the application of power. A force constantly applied by the powerful muscles at the shoulder is far easier to command and use than a force repeatedly applied by the much less powerful muscles governing the fingers. The artist has found this out, and uses the finger coördinated for resistance against the arm-power in fast, brilliant playing; and you will hear this quality enter into his playing when this technique of resistance is demonstrated. Then, if the finger is to transmit the arm-power by simply going to the bottom of the key, and taking a position for receiving the energy, this is exactly the thing that should be practiced. This action does not include a lift and blow. It is made up of an extension and vitalization of the finger or fingers. The perfection of these conditions must concern itself with the specific demands made by their coördination.

Furnishing of Power by the Finger. The relation of control between the tip of the finger and the shoulder is not unlike that in writing. The finger-tip makes the contact with the key just as the fingers hold the pen. Observe the writing produced by a cramped hand when the fingers guide the pen and furnish the power, as compared with the writing of the professional bookkeeper whose hand is very easy, and whose arm guides the pen and furnishes the power. The first will be uneven and angular, while the latter will be regular and flowing. An analogous result will occur at the piano if the finger is used to furnish the power for tone. It actually does make the contact with the key, but only because it is the end of the lever which receives its orders at the center of

the radius of activity, namely, the shoulder. Every joint must be flexible and controlled at the same time, so that no power will be "spilled" as it travels from the shoulder to the key; but no joint should be allowed to interfere with the flow of that power by attempting to furnish the power itself.

Pressure Touch. As there is no more definite meaning attached to the phrase "pressure touch" than there is to "relaxation," there is no way of knowing its import when various teachers use it. For that reason alone it is a dangerous term. The teacher may use it to convey that there should be no lifting of the fingers; but the student, unfortunately, may interpret it as meaning an inelastic pressure against the key. Even if only one of fifty students thus misunderstood the phrase, this would be a sufficient reason for discarding it.

Passing the Thumb in Coördination With a Wrist Action. The power that is producing the tone is being supplied and directed from the shoulder. Therefore, the action of passing the thumb needs to be coördinated with that source. If the thumb is coördinated with the shoulder there will be some play at the wrist-joint in making the adjustment, but it will be incidental, and one more chance will be avoided for misplacing the control for sidewise progression.

Passing the Thumb in Coördination With the Rotary Action. Exactly the same reasoning applies to this discard as to that just discussed. If the ear is trained to watch for fluctuations in the tone intensity, it will give the alarm if there is any interference by constriction at the elbow or wrist. Without constriction the rotary action will take place in its relation to the full arm when the thumb is passed in coördination with the shoulder, and that is always the desirable result.

Passing the Thumb With a Quiet Hand and Arm. If there are still those who believe that the thumb must be passed without the hand deviating from the five-finger position, and with no assistance from the arm, they need only watch the playing of any one of the masters of technique. Position is right or wrong only as it makes for or hampers quality and ease. Easy play in adjustment throughout the arm is necessary for the best results in thumb-passing.

Using the Thumb on the Side. Note the position of the thumb when the artist plays brilliant octaves. Like the fingers,

for all passages that combine brilliance with speed, the thumb belongs on end. For great emphasis, when there is a full arm stroke from the shoulder, the thumb can be used on the side to advantage, for then the shoulder is in control of the playing motions. But for speed with brilliance the thumb must have the same relation to the arm-power as the fingers, and that means playing on the tip.

Routine Drill, Without Emphasis, to Secure the Sensation of Muscular Adjustment for Power. Five-finger exercises, scale-playing and wrist octaves, practiced by the hour, with the attention focused on gaining more power in the small muscles, has not only wasted untold time for the student, but has also often definitely built a wall of strain into the mechanism which makes it impossible for him to see over it into the field of virtuosity. The ease and fluency of the artist is a mystifying achievement which the student credits to an overwhelming technical gift. Of course, there is a need for five-finger exercises and for scale-playing, but in practicing for the required skill in these fields the action must be the one demanded for transmitting the arm-power, and not one for producing more muscle in the fingers. There is never a time when the student can safely sit down to practice without first thinking out the adjustment throughout the arm for full coördination of wielding the power from the shoulder. It is the reiteration of the sensation of this complete coördination which cuts down the time of training in acquiring technique.

What about the players who say that they have practiced scales for five hours a day, for weeks on end? The answer is, "What about the players who say that they have practiced comparatively little to acquire their virtuosity?" To which class is it desirable to belong? Players of the latter class have always used large muscles for production, and have had a definite ideal of tone in their ears, and these two factors are the surest means of approaching mastery without loss of time.

The Getting-Off Process. At some stage in his studies the student probably has been told that half of the difficulty in playing is the getting-off process. Fast playing is what is here in mind, for resonance makes demands that do not enter in brilliant passage-work. The technique of the piano is concerned with producing tone; that is, with applying power at the key-bed. If the tone-producing action ceases at the precise instant the resistance of the

key-bed is met, and the arm-power is traveling constantly in a direct line to the next contact for tone, there is no need for the negative action of getting off the key. The whole attention should be centered on the positive action of applying power for the shortest possible duration of time and over the shortest distance.

Legato Finger Action in Fast Playing. Legato playing in a fast passage is the result of a flowing motive energy, which in itself brings about the desired connection between keys. If there is the effort to hold one key until the next is played, it hampers both ease and speed, and in no way enhances the sense of smooth legato playing.

It cannot be too often reiterated that time is always saved by doing only the one thing that is demanded. Many of the old traditions should be discarded for this reason alone. Perfection takes long enough to attain when we travel toward it in a direct line. Every unnecessary motion that is established takes time and also furnishes another opportunity for losing the greatest facility and simplicity in technique.

CHAPTER III

An Analysis of the Playing Mechanism

In this chapter I propose to analyze in a broad way the mechanism of piano-playing. This will be in the nature of a survey of the entire structure, which is really necessary before the student proceeds to try out the suggestions for acquiring the feeling of the desired coördinations. In this analysis no attempt is made to give the explicit action of the muscles which produce the desired tone. The desire is to suggest the simplicity in coördination that one sees and hears in the playing of such men as Rachmaninoff and Lhévinne.

The problem peculiar to the piano is to achieve a motive energy which in fluent playing travels sidewise, without interruption, while the contact for tone is made by the vertical action of a key which receives the dynamic power. We take it for granted that the key-action should not interrupt the flow of breath in the wood and brass instruments, but we fail to realize that the chief reason for the lack of simplicity in piano-playing is that the flow of motive energy is constantly being interfered with by the application of power to the key. This difficulty must be met and conquered if the musical continuity of the piano phrase is to rival that of the string and wind instruments.

In fast playing two ways of transmitting the power to the key are in constant use, illustrated by tones that have a special clip, and stand out in chiseled fashion, and by the smooth, limpid tones of a run which flow in a stream down the keyboard. Complete technical mastery of these two means for the transmission of power alone will meet all the demands of virtuosity.

The following premises which, as I have stated in the Prelude, are the result of many years' experience as a teacher of the piano, form the foundation of the remainder of the chapter, and, indeed, of the study.

The shoulder supplies the hand and fingers with the motive energy which travels sidewise on the keyboard, without interruption.

The forearm, acting from the elbow, takes the vertical action of the key when speed and greatest brilliance are desired.

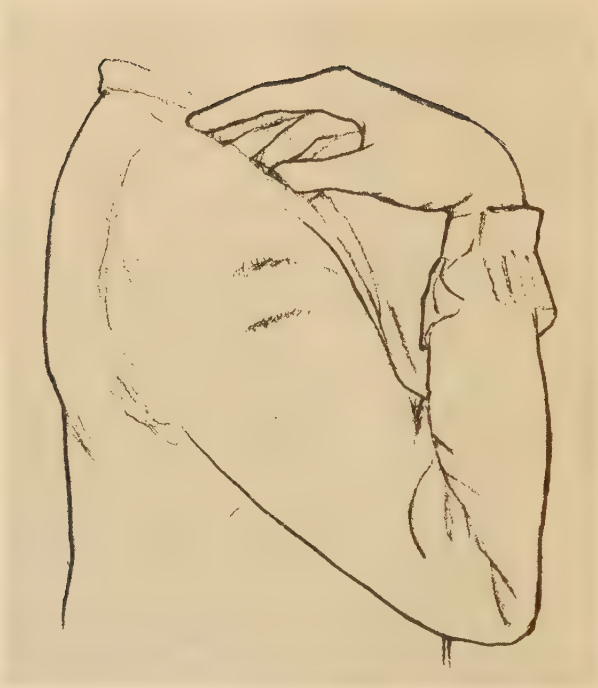
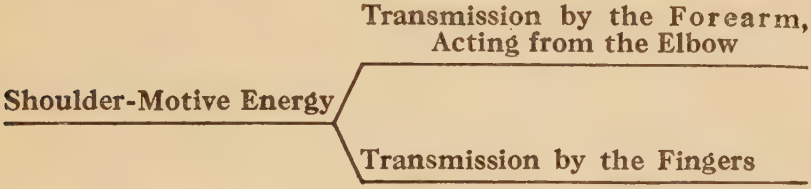


Illustration 1
Folding the forearm out of the way.

The fingers take the vertical action of the key when greatest speed and smoothness are desired.



Because the forearm-action from the elbow is always a repeated action, there is less speed with this technique than with the fingers, which supply five tools to use at will in a flowing, sidewise motion. It is the speed of the octave scale as opposed to the speed of the finger scale. Both are incredibly fast when there is no waste in movement.

We must always bear in mind the fact that the pianist's only means for emotional expression are his use of rhythm and dynamics. The pianist achieves tonal variety only by the intensity of the application of power.

If attention is always focused on the preliminary points indicated above, every act in acquiring technique can be delicately proportioned to perfecting the structure as a whole.

The first concern is a clear understanding of the sources of power and its manipulation, and that leads immediately to a discussion of the technique of the shoulder, leaving the easy muscle power of the forearm to be discussed in its turn.

The Shoulder

The first in importance among the shoulder-actions is the use of the right kind of power.

The second, of almost equal importance, is the governing of the sidewise progression of the hand on the keyboard—finding the place of the tones to be played.

The third is the accurate gauging of the level of the key-bed where the power should be applied and where the tone is produced.

The power available at the shoulder for these three purposes is muscle-energy and the weight of the arm as a whole.

Before reading the following paragraphs, fold up the forearm when working for the proper feeling at the shoulder. It is a simple means of insuring action from the right source. (Illustration 1.)

The muscle energy used for the piano is the same used in pushing a cart or wielding a sledge-hammer. A small hammer might be used from the elbow and a tack-hammer would be used with only a forearm stroke, but the sledge-hammer demands the power of the big muscles acting upon the shoulder-joint. So does leaning the elbows on the shoulder of a seated person, and holding him down when he attempts to rise. Use any method you like to discover how much muscle-power you possess at the shoulder while the forearm is forced to be inactive by being folded up. Then know that this energy, no matter how much power it has, should never be a clumsy, unwieldy thing, but must have the potential quality of the quick, powerful slap of the bear. It may appear to be quiet and inactive, but in reality it must be always alert and ready for instant action, and when power has been applied to the key it does not altogether relax, but remains at attention, just where it was before the action took place.

The weight of the arm controlled at the shoulder is used for resonance. To be effective in producing tone the arm is allowed to drop from a distance off the key, but always, when this force reaches the key, the muscle-energy is coördinated with it so that there can be no inelastic application of power to the key-bed. If weight were used as the sole motive energy the key would simply act as a block to its fall. That would involve unnecessary percussion for the amount of tone produced, and destroy the feeling for continuity in production which is essential in developing a delicately proportioned use of dynamics. Weight is a small element of the power used in fast playing. When speed is desired the muscles carry the arm, ready for action. There is no lifting and dropping nor relaxed weight against the key. The arm becomes a constant unit of weight poised at the level of the key-bed, and the weight element of the power used for speed is only the energy created by the momentum of the poised arm as it is propelled sidewise along the keyboard by the muscles of the shoulder.

The accurate control of sidewise progression from the shoulder, or its misplaced control by the forearm and hand, will determine whether one plays the piano easily or with effort.

Except for a slight action of the thumb in sidewise progression, the shoulder is the steering-gear of the arm and the hand. The hand travels to position because the shoulder guides it, not because it seeks to do so of itself. Think out this shoulder-action clearly,

and remember the disturbing fact that practically every use of the hand in the daily routine of duties goes counter to it. Permitting the shoulder to steer the arm and the hand sounds simple, and of course *is* utterly simple when attained—that is why it is right—but the hand is so accustomed to holding objects and to reaching out for them that only persistent attention will allow the shoulder to acquire full control when finding the place at the keyboard without any interference. While the arm is folded up, imagine the elbow making the contact with the key. Reach for tones all over the keyboard until a definite sensation of controlling the arm is registered at the shoulder. After the arm is adjusted to the playing position, trace the pattern of a chromatic octave-passage without tone. Try to experience no sensation of playing the pattern, but only one of gliding over the surface of the keys as a plane. No matter what means you use to secure the shoulder-technique of sidewise progression, see that the hand is simply an extension of the arm and does not lend assistance by reaching for the notes.

Easy manipulation of the right kind of power and control of sidewise progression at the shoulder are absolute necessities if piano-playing is to be simple and without strain. Accurately gauging the distance to the key-bed is equally necessary if the piano is to yield its utmost in dynamics with the greatest conservation of energy. A listening ear is not only the best guide, but is indispensable in training the muscles to a fine discrimination in the application of power. The ear easily becomes accustomed to listening for the percussive element involved in producing tone, and can be trained to gauge intensity of tone with all possible elimination of noise. For example, when I hear the surplus noise created by inaccurate application of power, and suggest a different approach in producing the tone, and ask the student if he hears the difference, most frequently his answer is, "I feel the difference." As tone is produced at the exact level where the lift of the hammer is controlled, the fully coördinated power should be used only at that point of resistance, and there should be no more sticking to the key-bed than there should be a sticking of the bubble to the surface it may meet when floating through the air. Watch the polo-pony's hoof in the slow motion-picture. There is constant progression, and the coördinated power which propels the animal is used only at the instant of the contact of its hoofs with the turf. Energy is conserved when the same elastic power is accurately

applied to the key-bed with the feeling that progression is in no way interrupted. Unless the sensation of the distance to the key-bed is established at the shoulder, it is easy to see that there can be no accurate use of power. It will be used in the air before resistance is met, and this involves waste, or it will drive past the level of the key-bed, which retards progression and involves waste of energy. Depressing the keys without tone, and putting the shoulder-energy against the resistance of that level with all varying degrees of pressure, is an easy manner of giving the shoulder muscles the sensation of where the surface to be used for producing tone lies.

Any constriction in the muscles acting upon the shoulder will, of course, interfere with ease. There must never be the feeling of huddling or of lifting at the shoulder, but always the easy play of the arm one has in walking with a swinging gait, when the body is erect and the lungs are full of fresh air.

The Elbow

It is the function of the shoulder to furnish the flowing motive energy for tone, and every other joint must see to it that this energy is safely transmitted to the keyboard without in any way changing its intensity. It cannot be altered for the fraction of a second, without damage, by the elbow, the wrist or the hand. They are simply the channels through which it flows. If any joint is relaxed, sluggish or constricted, it forms an impediment in the channel. All the joints must be at attention from the moment playing begins to the end of the composition.

The elbow is closest to the shoulder. If anything happens to break the connection there, then the hand ceases to have easy access to the shoulder-power.

The rotary action of the elbow and forearm is not interfered with by any other action at the elbow, and it is an unavoidable complement of the application of power from the shoulder; therefore, in the opinion of the writer, it does not need special training.

The real problem of the elbow is so to train it as to allow free extension action without for an instant losing control of the flexion action.

The triceps muscle, the extensor of the forearm, has both speed and power, and controls the movement for depressing the key when speed with great brilliance is to be attained. It furnishes the

positive action with which the elbow-technique is concerned. But unless the flexors are constantly active to keep the forearm hooked up to the primary source of power at the shoulder—only yielding to the act of extension, but not relaxing for it—it is an easy matter to let the powerful triceps muscle take full control of initiating the energy for tone. When this happens there is no basic flowing power uninterrupted by the action of the key. The power for extension inherent in the triceps is used in coördination with the power of the other muscles acting upon the shoulder. It should not be used as the sole supply of energy for tone. Its speed and power increase intensity in the tone, and therefore are used for brilliant tones and fast, fortissimo passages.

Flex the elbow, and, extending the forearm, try for greatest speed in repeated slight extension away from the piano. When the utmost in rapid extension is attained you will have a close, well-knit feeling between the forearm and the shoulder, and that is the desired control at the elbow. There is no need to train for power to secure this action of the triceps, for it is already there. The need is to secure its greatest speed in repeated action, and for this accomplishment attention should be directed to conserving distance in extension. Since the action of the triceps for depressing the key is a repeated action, it is wise to use only a minimum amount of its power in the first period of coördinating the mechanism, in order that the other muscles acting upon the shoulder may furnish the larger proportion of the energy used, and thereby establish the sensation of continuity of energy rather than that of repeated initiation of power. This increases the chances for a lilting rhythm and an easy flow of dynamics. Only after the shoulder has acquired this technique of flowing power is it wise to use a greater proportion of the power so easily available with the act of extension.

The Wrist

For those who have played the piano without clearly understanding the handling of power, the technique of the wrist is largely learning what not to do. The wrist as well as the hand is a tool for transmitting the power of the arm. If it assumes any of the controls which are more easily taken at the shoulder or the elbow, it retards progress and interferes with the greatest ultimate fluency. There is just one control for the wrist which positively makes for no

interference or strain in the mechanism, and that is when it is used to carry a poised, lightly-balanced hand as an extension of the forearm. It renders impossible a gap between the hand and the elbow. It initiates no power for tone and takes no control of the placement of the hand and fingers. Nor does the hand, acting from the wrist, depress the key. When the demand made of it is only to carry the hand in equilibrium it will remain flexible, and any slight adjustment in scales and arpeggios to assist in the placement of the hand and fingers will fit into the arm-adjustment as a whole in proper proportion.

The Hand

The more one knows about the hand the more one marvels at its skill. With its infinite capacity for delicate adjustment, it is no wonder that there is great disagreement among teachers as to the exact rôles it should assume in piano-playing. It is the consideration of the necessity of differentiating between dynamic power and dexterity that leads to the conclusion that the small muscles of the hand should be freed from every demand for power, in order that they may the more easily meet the multitude of demands for dexterity. As a tool for the transmission of energy the hand is easily adequate to its rôle, but as a tool both for producing the power for tone and for meeting all the demands for speed and accuracy, the burden is too great and the effort for complete accomplishment in the dual rôle produces confusion and defeats achievement. When every demand for furnishing dynamic power for tone and controlling sidewise progression is eliminated from the hand, the difficulties in acquiring a piano-technique are immeasurably lessened. It is only then that the superlative ease and skill of the masters of technique become a possibility for the gifted student.

Thus we should start with acquiring the technique of transmitting arm-power, rather than the technique of making the fingers equal in hitting strength. Webster defines reaction as "the force which a body subjected to the action of a force from another body exerts upon the latter in the opposite direction." The key, when played, is subjected to the force of the arm-power and exerts the force which travels back against the arm-force. Since the finger makes the contact with the key, it transmits the arm-force to the

intensity. Each finger must be able to duplicate the fist in transmitting the arm-power. When the result of reaction is felt, the other actions of the hand can be coördinated with its demands without distorting them.

The hand must furnish five fingers of equal length for the arm-power to play against, whether playing chords or scales. A last-minute adjustment of the fingers causes unnecessary complication. It is just as easy to carry the fingers in a position of readiness for the application of power as in any other position, if only the sensation of such an adjustment is once established, and then repeated until it becomes habitual. It is only the varying uses of the fingers for daily activities that make them unruly in this concerted action. The finger-line of the thumb and the little finger when receiving the arm-power is really straight. The three middle fingers adjust themselves to their length. (Illustration 3.) To gain the sensation of equal length in the fingers as they receive the arm-power, depress five keys without tone half the distance of the key-drop, with no variation in the level of the keys, as though they were forced down by a bar placed across them. When this action can be repeated with security in the maintenance of an equal level of the five keys, you will note that this adjustment is largely a palm-action, for it is in the palm that the sensation of holding the permanent position chiefly lies. This position should be constant from the moment of approach to the keyboard until the playing is ended. It should be achieved with the minimum amount of possible effort; never with a hard-set feeling in the palm, but with an easy, alert muscle-action.

We must next consider the action of the finger when it depresses the key. Stand on one foot with the knee bent, and then straighten it. In sensation there is perhaps enough similarity between the two extensions to furnish a hint for learning the finger-action. There is the difference that when the knee is bent the leg is still supporting the body, while it is only when the finger is extended that it receives the arm-power. It extends to complete the distance between the arm-power (which is ready at the first knuckle) and the bottom of the key, so that the power may be applied without being disturbed by the downward motion of the key. If the scale is to be fleet and smooth, the power of the arm must be free to course along the keyboard on one plane. As a specific means of gaining the sensation of the desired action of the finger, place

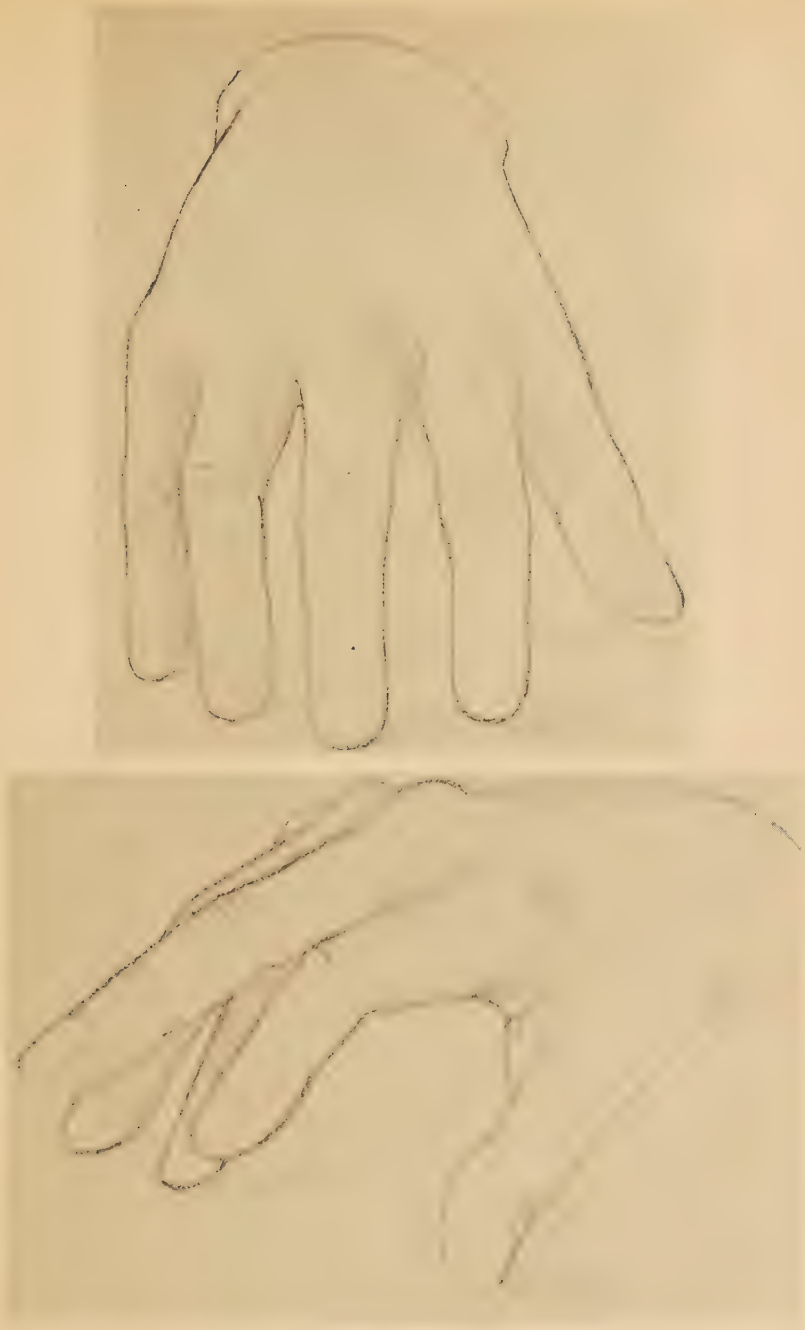


Illustration 3

Hand position in equalizing the length of the three middle fingers to the length of the straight thumb and little finger.

the right hand on the keyboard in its usual playing position. (Illustration 3.) Then, with the left hand, tap the middle joint of the right hand fingers. This drives the second knuckle in, thus lengthening the finger sufficiently to depress the key. After this forced extension the finger learns to extend with its own power, without bringing into play any muscle except that needed for the action. As the arm is brought into position over the key, the action of extension takes place with a precision of meeting the arm-power equal to the exactness of coördination between the bow-arm and the finger of the violinist when he plays a rapid passage with separate bowing for each tone.

The hand governs the spacing between the fingers for chord-formation and this it must do without any act of reaching in the finger-tips themselves. It is safe to think of this action as belonging entirely to the palm, to avoid activity in the finger-tips and any undue action in the forearm. Imagine holding a large bubble in the palm, which has become a smooth, shallow bowl, wherein it rests lightly. The slightest tension which makes for hardness in the muscles is disastrous to the delicate surface of the bubble. The sensation in the lightly extended palm is akin to the sensation of the opening up of the face when it registers great surprise; the eyebrows lift and the nostrils distend without the least feeling of tension or of a set quality in the facial muscles. Keep imaginary air-channels between the knuckles in the palm, so that no possible displacement can cause friction or strain. Even when every precaution is taken, the subtle difference between simple extension in the palm, and reaching with the tips of the fingers, will not be completely sensed until weeks of the most careful attention have been given to this very difficult control. When at last the hand is truly an accurate tool for transmission, and for transmission only, the ease with which it overcomes all difficulties is always an astounding experience.

Acquiring technique easily means gaining control with as little interference as possible from muscles not actually involved in the action. An important factor in this connection is differentiation between the actions of placement and of production. Playing an intricate passage over and over to acquire accuracy in notes never allows a full focus of attention upon the muscles which are responsible for accuracy in placement. Silent adjustment for position is far more effective in clearly locating the difficulty which causes stumbling.

The slightest confusion in the controlling factors must of necessity affect the entire mechanism. The coördinated adjustment throughout the hand and arm is exceedingly delicate. Use of the shoulder for speed, or use of the hand-muscles for power, or any similar faulty procedure is a waste of energy; and, unhappily, waste is never simply a negative element—it is a positive interference in the acquisition of any technique.

A skeleton outline of the functions of the different centers which need training for the coördinated mechanism is given below:

I. The Shoulder Controls:
   1. The motive energy: muscle-energy and weight.
   2. All sidewise progression, with the exception of a slight action of the thumb.
   3. An accurate gauging of the distance to the key-bed where the tone is produced.

II. The Elbow Controls:
   1. The action of flexion—hooking the forearm up to the base of supply of energy at the shoulder.
   2. The action of extension which depresses the key in brilliant passage-work.

III. The Wrist Controls:
   1. The carrying of the hand in equilibrium as an extension of the forearm.

IV. The Hand Controls:
   1. The springy finger-line for transmitting both the power of the arm to the key and also the force of reaction of the key against the arm-power.
   2. A free first knuckle, which helps to localize the point where the force of reaction meets the arm-force.
   3. The action of the finger for depressing the key.
   4. The equalizing of the length of the five fingers for accuracy in transmitting the power to each equally.
   5. The sidewise spacing of the fingers for chord-formation.
   6. Some slight light sidewise progression in the thumb.

CHAPTER IV

The Thumb

While the thumb is easily the most valuable finger of the hand, at the same time it presents the greatest difficulties in the way of mastering piano-technique. ("There are experts in accident insurance who rate the thumb at half the value of the hand"; certainly, if the thumb be clumsy and uncontrolled, the pianist's hand loses half of its efficiency.)

Of primary importance is the fact that in all its activities at the piano the thumb must conform properly to the demands of the force of reaction, meeting the arm-force in the same manner as do the fingers. Otherwise, obviously, there would be a difference in the intensity of tone which it produces. The fact that the tone made by the thumb stood apart from the tones made by the rest of the fingers has been the bugbear in scale and arpeggio playing.

The multitude of habitual and daily uses of the thumb causes many of the difficulties which hinder the gaining of piano-technique. The fundamental problem of the thumb is similar to that of the fingers. When transmission instead of production becomes the rôle of the hand, and when the technique of reaction assumes its rightful importance in the mechanism of playing, many of the debated problems of the thumb's activities are solved. This fact cannot be too strongly emphasized.

"The hand of man differs from that of the anthropoid apes mainly in the greater development of the muscles of the thenar eminence (the ball of the thumb) and in the habitual position of the thumb, which is one of much more complete opposition to the fingers."[1] "The greater development of the muscles of the thenar eminence" gives the cue for the rôle of the thumb at the piano.

There are eight muscles controlling the thumb; four lie along the forearm and four in the ball of the thumb, which is the palm-segment of the thumb. When a faulty action is established, the muscles of the thumb lying along the forearm, more than any other muscles controlling the fingers, are the ones which interfere with the freedom of the wrist. In other ways, too, the thumb can easily destroy ease and smoothness in playing.

[1] "Applied Anatomy and Kinesiology," by Bowen and McKenzie.

But if, in acquiring piano-technique, attention is focused on acquiring the movements demanded of the thumb with the muscles of the ball of the thumb, the chances for easy manipulation are greatly increased. Although it is not accurate to say that all sidewise extension of the fingers and thumb lies in the palm, it is an aid in avoiding undesirable activity to think it entirely there. That is, by acquiring all the technique possible with the muscles of that part of the palm which constitutes the ball of the thumb, the work of the muscles which lie in the forearm is made as light as possible; and this means a short cut in acquiring the skill demanded for piano-technique.

The thumb's daily job is gripping and holding things; in all delicate skill with tools, the tip of the thumb, together with one or more of the fingers, largely controls the handling of the tool. But for the piano the control of activity needs to be localized almost entirely in the palm-segment, and the tip acts only because it is an extension of that segment, not at all as the guide of the action. This point needs constant attention.

The problems, then, so far as piano-technique is concerned, are centered around the second joint and the wrist-joint of the thumb. Ask a piano student, or anyone else, to show his fullest extension, and it immediately appears that the tip carries out a large part of the extension, not the first and second joints, as is desirable for piano-technique. The tips of all the fingers must be kept free from the sensation of reaching, and the thumb, with its function in the sidewise progression of the hand up and down the keyboard, is the hardest finger to train in this respect.

The functions demanded of the thumb are:

1. A sturdy line for the power to play against.
2. Freedom at the wrist-joint, where the force of reaction meets the arm-force.
3. Playing on the tip, not on the side.
4. Ability to extend itself under or out from the hand, and to assist the sidewise progression of the hand in passage-playing without sacrifice of the first three functions.
5. Vertical action for depressing the key.

A sturdy line from tip to wrist-joint means a straight line for the thumb, because of its shortness, yet an easy straight line. If there is any difficulty in assuming the straight line position, it is

Illustration 4
Exaggerated defect in thumb extension.

because of over-extension at the tip and lack of extension at the second joint; and the remedy of these faults is discussed with the problem of sidewise extension.

Freedom at the wrist-joint is made difficult by extension and sidewise progression, and is discussed in that relation. With the thumb in an easy, natural position beside the hand, it is a simple matter to maintain a free wrist-joint.

Playing on the tip is necessarily a part of the thumb's equipment (as are the first two functions) if it is to meet the demands of reaction. But even players who use the fingers for hitting instead of for transmitting power, use the thumb and little finger on the tip, and held straight when they want brilliance. If that be true, there is no legitimate reason why the position should change when full brilliance is not demanded, when the hand is not furnishing the motive energy which produces the change in dynamics, but only the means for its transmission.

The sensation of the sidewise extension of the finger and thumb should be localized between the second joint of the thumb and the first knuckle of the little finger. The fullest extension at the second joint is the first necessity of a good thumb-technique. Every teacher would rather face almost any other difficulty in the mechanism than a bad thumb-extension, with a weak second joint. It is almost certain to be one of the attributes of a hand that is inadequate in chords. With the small hand the most hopeful place for the gaining of a greater extension is at the palm-segment of the thumb. A not uncommon defect in the extension of the thumb is shown in Illustration 4.

The initial step in acquiring the desired condition in the palm-segment is to get rid of all sensation of reaching in the tip. Only then can one proceed to find a means for exercising the muscles controlling the action of the first (wrist-joint) and second joints. Any action that is to be made by the muscles in the ball of the thumb must at first be very light. If any feeling of power comes into the action, it is almost certain that that power will be furnished by the stronger muscles which lie in the forearm. Accuracy of movement and not force of action is always the aim when the hand is trained as a tool for transmission. Every action should be as light as possible, and the minimum of power should be used for achieving control. When the desire is to localize action at the first and second joints, the surest means of getting rid of action at the tip

is to flex the tip and allow it no further action while the first segment is put through all its movements. (Illustration 5.) Three primary actions should be worked at while the tip is in this position—extension, flexion, and lifting the thumb to the level of the palm. Full extension away from the palm will bring the thumb on a level with the palm, but it is desirable that the action of lifting the thumb to the level of the palm should be also a separate action without extension. Flexion, or perhaps more accurately adduction, at the wrist-joint of the thumb, should be repeated to ascertain what the distance of movement can be without its affecting the freedom of the wrist-joint; and then that distance should be used when practicing for speed in the action. When these motions are clearly established, the task is to keep them independent of any action of the tip when it is extended to a straight line. The tip of the thumb must not be allowed to interfere with simplicity in the control of the movements of the palm-segment of the thumb.

In all other exercises for acquiring new actions, the action is performed with the idea of dexterity, not with the aim of creating more power in the muscle. The perfect muscular adjustment is all that is necessary; there is already sufficient power to be used, and constant attention to accurate action will give the hand the desirable coördinated amount of power from the various muscles. This, however, is often not the case with the muscles acting on the palm-segment of the thumb. The muscles controlling the weak second joint may need weeks and months of careful exercise for the creation of greater power; and unless this exercise is repeated with scrupulous accuracy and regularity, a free and full manipulation of the thumb can never be achieved. A complete thumb-extension means ease in octaves and chords; without it the utmost ease and brilliance are never realized in the chord technique. The length of the fingers in no way compensates for the lack of this thumb-extension.

There is no more difficult coördination in the playing mechanism than that of the thumb in relation to the sidewise progression of the hand up and down the keyboard. The amount of flexion demanded of the thumb for scale- and arpeggio-playing is a subtle point. Remembering that the straight line must be maintained, and that the wrist-joint must be kept free from constriction, we shall note that the thumb quickly reaches a point past which it cannot be flexed under the palm. The distance which it can reach

Illustration 5
Tip of thumb flexed to avoid action while first segment is put through all its movements.

Illustration 6

The distance that the thumb can be passed under the palm without sacrificing the straight line and the free first joint.

Illustration 7

Showing that the larger part of the flexion takes place at the second and third joints when the thumb is passed under the palm.

under the palm, without sacrificing the conditions just noted, is not, however, sufficient for the demands of smooth scale- and arpeggio-playing in a slow tempo. (Illustration 6.) Note the action when you touch the base of the little finger with the tip of the thumb. (Illustration 7.) The larger part of the flexion takes place at the second and third joints. Compare Illustrations 6 and 7. This flexion prevents maintaining two of the functions necessary for duplicating the finger-tone—playing on the tip and keeping the straight line for the arm-power to act against. Thus it is only the flexion at the wrist-joint of the thumb that can be profitably used in piano-playing; therefore some other joint must be used in coördination with the thumb to secure sidewise progression. This joint is the shoulder. The coördination of these two points of action should be kept constantly in the spotlight of attention, if the thumb is not to be ruined by demands for functions which do not belong to it in piano playing. For acquiring this coördination between the thumb and the shoulder for lateral progression, too great care cannot be taken to avoid any constriction at the wrist-joint of the thumb. Again, as so often in the discussion of playing, words little convey the full damage done when there is even a very slight misplacement of action. It is not possible to watch a fluent player even for a few moments without seeing, beyond the shadow of a doubt, that he is always making adjustment at the shoulder for the approaching thumb-action. When the position for a direct vertical application of power is favorable for the second finger, it is not equally favorable for the thumb, even when the thumb is in its normal position beside the palm. When it is necessary for the thumb to be passed under the hand, the condition becomes less favorable for the vertical application of power against it, as the distance under the hand is increased.

It is then that the shoulder adjustment is needed; it tilts the arm until it is possible to apply the power at an approximated vertical position without losing the straight line of the thumb or constricting the wrist-joint. (Illustration 8.) The shoulder not only does the adjusting, to make the application of power as nearly vertical as possible, but in addition all the sensation of finding the place is at the shoulder. The slight action of flexion of the first joint of the thumb should not go as far as a sensation of reaching for the key. All sensation of seeking the key to be played belongs at the shoulder.

The kind of adjustment made by the shoulder differs in slow and fast playing. There is greater need in a slow tempo for a connection between tones. There are times when the pedal cannot be used for legato, and then it is necessary for a more exaggerated adjustment at the shoulder. In fast passage-work there is very little tilting of the arm, and instead, the same directness of approach from one thumb-tone to the next as if the thumb-tones succeeded each other, as in an octave arpeggio-passage. There is always the danger, in using a slow tempo, either for observation or conscious control, that when the need for the adjustment of the playing mechanism for speed is gone there will disappear with it keen alertness in the muscles and actual coördination for speed. The fact that slow practicing perfects a mechanism unadjusted for speed is one of the perils of demanding a slow tempo, unless great pains are taken to see that the action is quick and the whole arm is buoyantly alert. For that reason it is much safer to use staccato in most slow practice; but it is in a slow tempo that there is a demand for a pure legato in passing the thumb under the hand, and it is then that the greater adjustment at the shoulder takes place, so only legato practice will meet the explicit demands of this coördination between thumb and shoulder.

In the following exercise, suggested for acquiring the sensation of the coördination between the thumb and the shoulder in sidewise progression, there will be exaggeration of the shoulder-action because of the stationary position of the hand. Place the second and third fingers of the right hand on C sharp and D sharp, and have them maintain a light contact with the keys without depressing them. With the thumb on B, ready to meet the requirements for reaction, play repeated tones, action from the elbow, until there is satisfaction as to the tone produced; that is, until the tone duplicates that produced by the fist, as in the first exercise for gauging all the elements which produce a full tone, given in the third chapter of this study. Then, with the action still from the elbow, play C, D, E, F with the thumb, while the second and third fingers still remain lightly poised over C sharp and D sharp. Unless there is an exaggerated adjustment at the shoulder to allow the power to play against a straight thumb with a free wrist-joint, there will be failure to duplicate the intensity in succeeding tones; and the greater the need for adjustment, as for E and F, the greater the failure to keep the quality full. But when there is success in

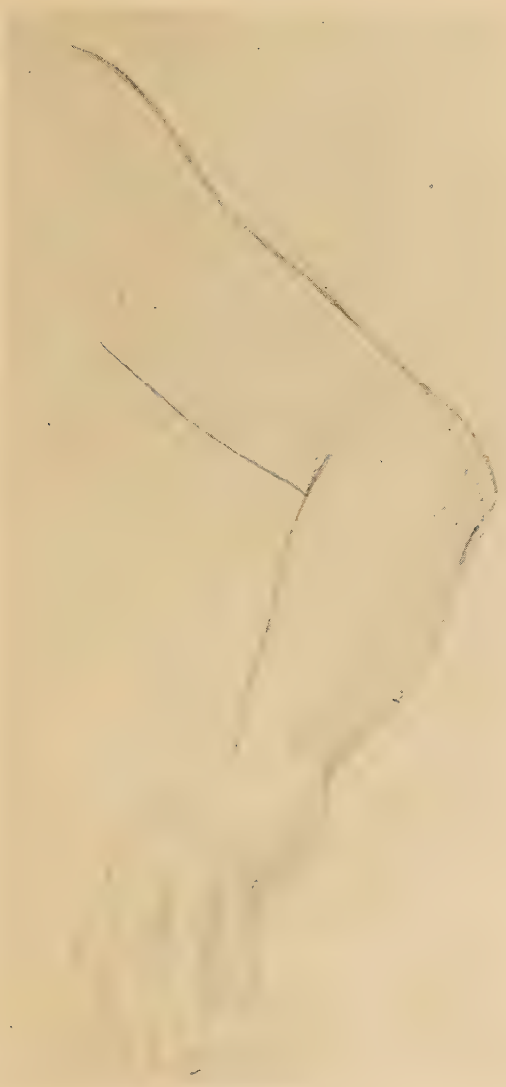


Illustration 8

Adjustment at the shoulder to make it possible for the thumb to connect in passing without losing the elements necessary to secure the reaction.

achieving an equal intensity in tone on each of the keys, there will be a clear sensation of the coördinated action of the shoulder with the thumb in the action. It may be well, now and then, without maintaining any contact with C sharp and D sharp, to play the five notes, in order to keep a fresh impression of the tone desired in the ear. If the student has succeeded in producing a vital tone throughout the exercise, in this position which demands such extreme adjustment, there will be far less difficulty in producing equality in tone with the fingers in the usual position for the passing under of the thumb. But because in the scale the position is not so difficult, the thumb is far more likely to take over the whole action without the assistance of the shoulder, and unless the utmost attention is paid to the equal intensity of the tone, the lack of the assistance of the shoulder will not be detected. It will be perfectly obvious that the complete adjustment at the shoulder-joint for the thumb-action cannot take place all at once. In all passage-work there is a constant preparation for the thumb-action, so in reality there is always only an approximation of the vertical position for all the fingers. If the scalloped effect that is seen in fast arpeggio-playing be closely analyzed, it will be noted that the curve is guided by the shoulder and not by the hand. When the analysis is to be made, artists who play with ease should be chosen.

The vertical action of the thumb in depressing the key will be prepared for if the action of lifting the thumb to the level of the palm has been established as suggested. In practicing the lift there has been an opposite downward action, the actual playing movement. The problem is that of gaining speed and of using the minimum of muscular energy for making the action accurate. Think the action entirely in the wrist-joint, the center of the radius of activity for the thumb, and allow no control by the tip.

The remark is often heard that the little finger determines the brilliance of the octaves. This is true only when there is sufficient extension in the hand for the octave to be played in the position that the average hand can play a sixth. If in the octave span there is insufficient extension to exert pressure with equal facility on both the thumb and the little finger, without in the least sacrificing the elements demanded for reaction, then the octave gains in ease and brilliance when a perfect adjustment is made for the thumb, even at a slight disadvantage to the little finger.

Try the following exercise to prove this statement about the octave, remembering that exaggeration is often helpful in first acquiring a sensation of touch when the adjustment is a subtle one. With the thumb fully extended away from the palm, tip the whole hand until the palm is at a right angle with the keyboard and play a note repeatedly with the thumb-action from the elbow. While continuing to play the repeated notes, adjust the hand to the playing position of a sixth, without losing the straight thumb-line and the feeling of direct reaction against the wrist-joint, and without change in the intensity of tone. For most hands the sixth is an easy position for maintaining the straight line from the tip to the wrist, and for giving the sensation of equal length in the thumb and little finger. Brilliance with the sixth is easy, for there is no difficulty in this position; but note with each added key in extension how it becomes less easy to put the pressure against both the thumb and little finger equally without sacrificing somewhat the proper position and feeling of resistance in the thumb. The thumb is far sturdier than the little finger for standing up under power; if brilliance is desired it is unwise to sacrifice any of its advantageous position.

One other suggestion for gaining the sensation that the thumb when extended, is a free, independent member of the hand, may help to facilitate acquiring control of the other factors. Lean the left elbow on the table in the glove-fitting position, with the palm turned away from the body, and, while maintaining an easy but sturdy upright position of the hand, hang the right arm on the thumb by hooking the second and third fingers over the thumb, placing the fingers in the curve between the second joint of the thumb and the palm. (Illustration 9.) Exert a straight downward pull with the right arm, so that the fingers force extension from the wrist-joint. Remove the right-hand fingers and see if the extended position of the thumb can be maintained without strain. If it can, then begin the process of relaxing and repeating the extension, letting the thumb furnish its own energy for the action. Take notice whether the thumb, when it does its own extending, has the same light muscle-action that it had when it simply held the position after a forced extension.

It takes patience and persistence to acquire a first-rate thumb-technique; if, however, the student once attains a good thumb, there are few obstacles that are not the more easily overcome.

Illustration 9
Position for forcing the thumb away from the palm.

Every superfluous action may destroy ease and quality. It is true that the whole coördination is frequently disturbed by the surge of emotion, but the greater the artist the greater is his control of the tools of expression, and simplicity in the mechanism always enhances the power of the message.

CHAPTER V

The Teacher's Technique of Teaching

This chapter is a response to the request of a number of my students who have asked for a specific guide for their teaching. The technique of the teacher is so subtle and varied, constantly changing in accordance with the needs of the student, that it is only possible, in a single chapter, to give a bare outline of the procedure. The problem of the teacher is to find a means which will give the student an accurate sensation of the coördinated actions for producing power and transmitting it to the keyboard. With the student passive, I exercise the muscles for him until the sensation of the desired action is sufficiently established for him to achieve the action with his own energy, and throughout the entire procedure I keep close contact with the muscles by placing my hand over his hand or on his shoulder, so that I may know exactly what is happening.

For more detailed explanation, let me emphasize once more a few matters discussed earlier in this study. It cannot be stated too often that the simplest mechanism is the most perfect, and that therefore the artist who shows the greatest ease and simplicity is the one who should be taken as the model. If the teacher fails to teach simplicity, the student should turn from that teacher's methods to those of the artist who produces with simplicity. It should be possible, if simplicity in the mechanism is understood, to succeed in teaching simplicity in every case, given the capacity for dexterity in the student. It is the lack of accuracy in the demands made upon the small muscles in the hand which causes a large percentage of the failures among talented students. Perfection cannot be attained until each part of the hand and arm is in perfect coördination; but there must be a starting point, and it is important that from the beginning everything learned should be of such nature that it can be built into the finished structure. There should be no need to discard the first tools after a certain amount of the coördination process has been established.

It should also be said that the successful teacher is frequently one who has unusual discrimination in judging the attributes of perfection, and whose personality inspires the student to his

greatest effort, though not infrequently this teacher fails to impart accurate information concerning the means of producing perfection. In such a case the gifted student, very often stimulated to his best effort, finds the means for measuring up to the demands made upon him. That is my explanation for the great technical variance among pupils of the same teacher, and of the difference in the points of emphasis brought out by teachers trained at the same source.

According to my procedure the teacher's efforts should always be focused on teaching the most difficult problems—the problems that the student might fail to solve if not given adequate help. I do not believe in approaching difficulties step by step. If it is possible to give accurately the sensations which will make octaves and a trill in double-thirds possible from the outset, then why not start in at the beginning perfecting the most difficult coördinations? It means hurdling many of the tiresome and less important approaches. The only reason why a student cannot play a trill in double-thirds is because there is lack of control; but if the motions and conditions needed can be accurately analyzed, and the sensations of activity carefully registered, he can go to work on this difficult problem without danger of strain. By achieving a moderate amount of fluency he has established at once a knowledge of and differentiation in the actions of the hand which make a host of other lesser problems non-existent. Equally important is it to learn the octave-technique at the beginning, together with an easy handling of diminished seventh-chords. They can be played readily when the mechanism is adjusted rightly. But everything balks if the coördination be faulty. It is the wisest procedure to establish at the beginning the motions and conditions demanded for difficult problems in technique, such as double-thirds, trills, octaves and chords, for without the right muscular adjustment for playing these difficult patterns, the mechanism becomes strained and uncomfortable, and the student will know immediately that something is wrong. It makes very large demands on the teacher, but it saves the student from traversing vast deserts of wasted time and energy.

No account of the reading process is taken in this discussion, but, in passing, it is suggested that lines and spaces mean certain positions on the keyboard. Naming notes on the page and on the keyboard usually serves to create an undesirable result. What is

needed is that the eye should register the position of the note, and to remember that it has just one position on the keyboard. Combinations of notes are better than single notes for the beginner, because they serve to accentuate the relative positions of the notes.

I am assuming that the beginner is an adult, but if I were to teach a child I should approach the same problems at the same stages, adapting the instructions to the span of the hand and the capacity for reading.

The all-important point, for the hundredth time, is that at the outset the shoulder should assume control of the dynamic power and of sidewise progression. First, I place my left hand on the shoulder of the student and my right hand under his elbow, having asked him to fold his forearm out of the way, and ask for a downward pressure, not weight, but the same energy needed to resist the table, should it begin to rise from the floor. He gives me three times the amount needed for the piano, and it is a set, hard action; yet exaggeration is valuable at first, in localizing activity. Then, by putting energy into my hand at his elbow, I force action at the shoulder in all directions while he maintains a constant pressure against my hand. He finds out that the energy needed must in no way constrict the activity at the shoulder-joint; and to conform to all the many movements I demand of the shoulder, his pressure gradually becomes less resistant and set, more alert and active. The final step is keeping the shoulder just as active when I cease to create any resistance in my hand at the elbow. I take my hand away and notice whether there is the slightest drop in his arm. If there is, then I know that he has relaxed his attention, and the same procedure is repeated until, when I remove my hand, his arm is just as ready for action as at the beginning, when he was forced to meet resistance. I then test him out on the quickness of his response if I attempt to raise the elbow when I have asked him to keep the energy ready at an exact level; for in playing, later, that energy stands at attention at the keyboard. When the resistance of the key is met, it is at that very instant he uses the dynamic energy for producing the tone.

So far the attention of the student has been directed towards establishing the sensation of the control of the power to be used. Now there must be a definite sensation of the control of sidewise progression. That is simple, for if he is asked to reach for a certain

Illustration 10

Position for direct pressure from the shoulder against the teacher's hand in order to force action at the elbow.

key while the arm is still folded, he can only point to the key with the elbow; this will mean that he has used the shoulder-muscles to guide the elbow towards the key. I have him trace a pattern of notes with the elbow, perhaps a chromatic scale, up and down, for an octave.

During the whole time I have kept my hand on his shoulder so that I may know just what the condition of activity has been, whether elastic and attentive or sluggish and relaxed, and, of course, I further suggest in words, often by comparison with other processes, any kind of control that I desire. All this takes a very short time. The shoulder is adequate for power and habituated to using it, and it needs only such hints as those just given to get it to control the guidance of the arm for playing.

The next step is to secure the feeling of the shoulder-action as a constant element while the elbow is free to move. I change my right hand from the student's elbow to his fist. The fist should be lightly closed, with a straight line from the knuckles to the elbow—with no bend at the wrist—and I assume a position which makes it easy for him to exert a direct downward pressure from the shoulder against my hand. (Illustration 10.) I am careful to see that when the energy is thus started at his shoulder he exerts no bracing in his hand, and that there is no separate downward pressure exerted from the elbow. The whole arm is passive, except for the slight activity needed to keep the wrist or elbow from folding up when the shoulder-pressure is exerted. Again, as when my right hand was against the student's elbow, I demand all sorts of movement of the arm from the shoulder-joint, while the pressure against my hand remains constant. Always careful that the pressure shall not constrict the activity of the arm from the shoulder, I force action from the elbow with my control against his fist, while demanding constant pressure against my hand from his shoulder. I supply the energy for manipulation of the elbow-action while he furnishes only the shoulder-power, until the sensation that he can maintain a constant pressure from the shoulder against my hand while still flexing and extending his forearm from the elbow, is definitely established. Then, as before, my right hand is removed, while my left hand still covers the action of his shoulder-muscles, and the same condition of alert, attentive power at his shoulder must remain, to act against the key when the resistance of the key-bed is met.

The first tones are produced with the hand in fist-formation, while the shoulder furnishes the energy and the playing motion is from the elbow, for it is important that the first coördination of the hand and arm for tone should include capacity for speed. It is easily demonstrable at this point that the forearm, used from the elbow, and not the entire arm used from the shoulder, is what is adapted for speed. Play repeated tones with the shoulder in control both of the power for tone and the movement of the entire arm, that is, with no repeated flexion at the elbow. Immediately there is effort without any result in speed. For speed, the shoulder furnishes the power, but the forearm from the elbow executes the playing action, without disturbing the shoulder-control of the power. Before any contact for tone is made with the fingers, a firm tone should be established, with the fist making the contact with the key. If a repeated tone is achieved without conscious effort, with speed and a flowing quality, and without detachment of the notes, then we know that the shoulder-action is rightly coördinated with the action at the elbow.

The right action at the wrist should have been secured the first time that pressure against the hand was exerted. It should continue to maintain an easy, straight position without bracing or a set quality, with neither tension nor relaxation, as it transmits the power of the arm.

Before the student is asked for the octave, the fullest extension of the palm is forced into his hand through manipulation by the teacher. The thumb-action comes first. In this act it is most important that I should create no resistance on his part by any pinching of his muscles. That is, I must apply the pressure in such a manner that it never hurts. The thumb is taken into my palm and held as in Illustration 11. I do not hold the thumb between my own thumb and one finger merely. That would pinch the thumb, unless only the light exercise of lifting and extending downward is being given. What I do is to take the two last phalanxes of his thumb between my fingers and the ball of my thumb, as in the illustration. I then exert force for fully extending the student's thumb at the second joint, the pressure being applied against the second joint as illustrated. With the other hand, as is illustrated, I take the whole surface of the back of the student's hand into my palm, so that when I forcibly extend his thumb the pressure is spread over a large part of the surface of his hand, and

Illustration 11
Position for forcing thumb extension.

there is no one spot that hurts from the pressure. I have all the muscles of his hand covered so that I know just what is happening, and when he is asked to maintain the extension forced into his thumb, I can regulate the amount of energy he uses to hold the position. It must be the minimum amount of energy possible to maintain simply the extension—no fixed, hard action of the muscles. That is his first important lesson in the technique of the hand: to use only enough energy, never the least overplus.

While I thus cover the muscles of his hand, I manipulate his thumb for two motions; first lifting the thumb to the level of the palm, and then extension away from the palm. Because the tip lies in my palm, I can force the control of these actions into the muscles acting upon the wrist and second joints, and I can know whether his action is a pure thumb action, without any bracing on the outside of the hand, the little finger side. At first, when the student is asked to produce the thumb extension, there will invariably be a sympathetic action on the opposite side of the hand. This must be done away with so that the thumb becomes an independent member of the hand in all its actions. Too much care cannot be taken to see that right habits are established at the outset.

Then the manipulation of extension is similarly carried out between each pair of fingers. As I held the student's thumb (Illustration 11) I now hold one of his fingers in each of my palms, and force them apart by a crowding outward pressure exerted by my fingers against the base of his fingers. The student is passive, that is, his wrist as well as hand is relaxed, until I ask him to hold this extended position. Then he must be able to maintain the position with only the muscles which lie in the palm, and if activity comes into the finger-tips or wrist, I repeat the crowding pressure until he gains sufficient control of the muscles between the fingers to hold the position without vitalizing the tips or wrist.

During this manipulation I call attention to the fact that the fingers are hanging from the first knuckle, that the activity in the palm can be maintained without constricting their freedom. Then I ask for free movement of the fingers from the first knuckle while the palm maintains the extension. In this manner I establish the sensation that the center of the finger-activity radius is the first knuckle, and when pressure is applied against the finger he still must be able to maintain the sensation that the finger-line

stops at the first knuckle, and not at the wrist, as frequently happens when full extension is demanded. Illustrations 12 and 13.

When the student through these manipulations has secured the full extension of the hand, with a light, flexible muscle-action and no waste of energy, the next responsibility of the teacher is to see that in the first approach to the keyboard when the fingers depress the keys, there shall not come into either the wrist or the tips of the fingers any action of reaching for the key when the hand starts toward the keyboard. This action is another disastrous thing that invariably happens. The hand is too accustomed to governing the arm immediately to assume the new rôle of allowing the arm to govern it. So again the teacher makes the first contacts with the keyboard by manipulating the action for the student. The alert teacher never takes it for granted that the student has learned this very important lesson. For months I take the hand into mine and determine, by covering all the muscles, whether reaching has been eliminated in the wrist and fingers. When the forearm, used from the elbow, makes the playing movement, it is waste and interference to let the hand assist in the action.

When the octave is to be played, there is a demand for the coördination of all the conditions and motions thus far discussed. The hand is prepared for the octave extension without strain, with the thumb and little finger straight, and placed on the keyboard. Then, with no sensation of playing the notes, the shoulder should trace the pattern of the chromatic octave scale without tone, by simply skidding over the keys, like following a continuous line on a large map. When there is a definite sensation of this pattern being traced from the shoulder, the contact with the key is made, and a repeated octave played on one note. When the repeated octave has a good, flowing quality, and the hand has not changed position or taken over any of the control of the tone from the shoulder, but is simply alive to the fact that it stands under the shoulder-power, then I ask the student to start to trace the pattern from the shoulder, without interrupting the sensation of the repeated octave or in any way changing the conditions of the hand or the elbow. If the action at the shoulder for guiding the hand into position remains a separate and distinct one, the octave will move without strain. Constant repetition of the procedure is asked, in order that a fresh impression of the various

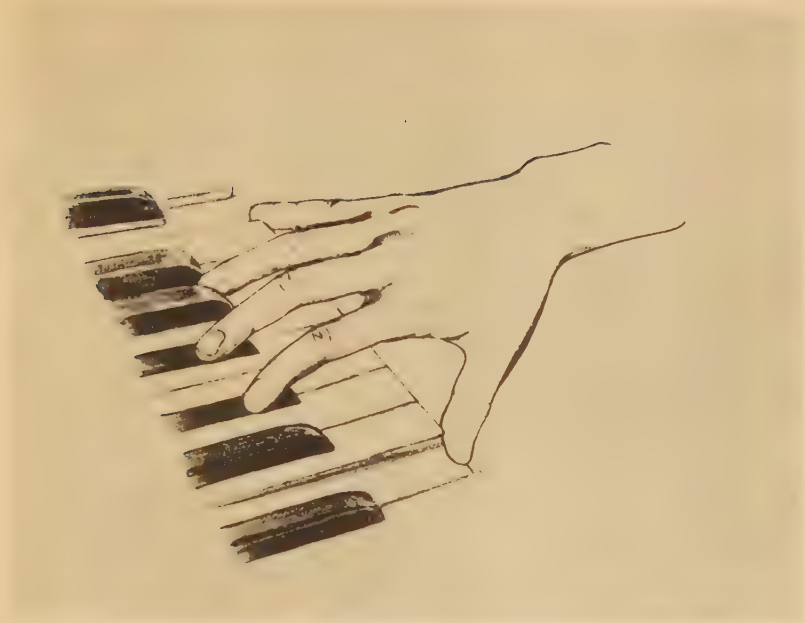


Illustration 12
Right finger line with extreme extension.

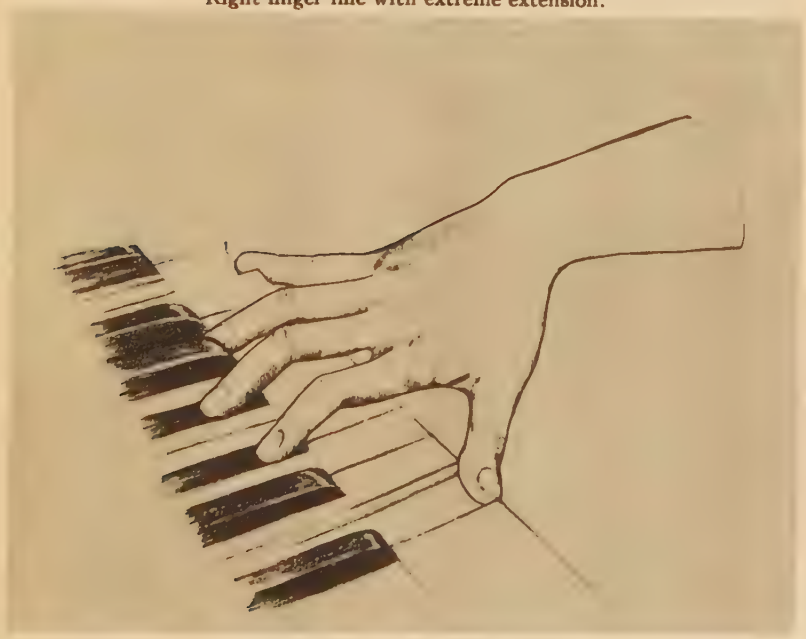



Illustration 13
Faulty finger line which is often a result when establishing extreme extension.

motions, conditions and sensations may be the outstanding result of the lesson.

With the octave achieved, the diminished seventh is worked for, so that the same relation between shoulder and hand may be achieved in this more difficult extension of the fingers on the keyboard. That is, there should be the same coördination for tracing the pattern on the keyboard from the shoulder when the three middle fingers are also used. With a small hand there is immediate difficulty in keeping the sensation of extension between these three middle fingers in the palm, and not at the tips; and it is not easy to succeed in having the finger-line definitely stop at the first knuckle, instead of going back against the wrist in this difficult extension. The first knuckle will cave in and the palm will become tense and hard, and invariably the hand will dive for the key the minute an approach for tone is made. All of the first procedure for gaining extension in the hand is carefully gone over again. In addition, repeated notes, with every combination of the middle fingers, are played by my holding the hand in position and furnishing the power. Manipulating the student's right hand, I hold the ball of his thumb lightly between the tips of the fingers and thumb of my left hand, with the ball of my thumb lying along his wrist. My right hand similarly holds the little finger side of his hand and wrist. With my hands covering the surface of his palm and touching the wrist along both sides, I can detect any muscle-action in his wrist and fingers. Making sure that there is no activity there, I raise and lower his forearm from his elbow. When there is no reaching for the key by the hand or fingers as the keyboard is approached, and the sensation of idleness is established in all the muscles except those acting upon the elbow, I ask for the fingers to become sufficiently vitalized to assume the position shown in Illustration 3, and to stand under any power that is applied. All combinations of the chord are worked at, except those including the octave, with attention to a constantly renewed impression that the act of extension comes from the palm, and that the finger simply stands under the palm. You may ask, why not start with an easier chord? Because practically all the difficulties appear only when difficult extensions are asked for, and it is there that the teacher is most needed. If I am assured that the most difficult conditions and actions are achieved, I do not have to worry about the rest. The wrist will behave properly only when the finger-

line stops definitely at the first knuckle. Therefore no playing of the full chord is allowed until the same coördination is established which made the octave easy. It can be done quickly, and by quickly I mean within two weeks, if the teacher can see the pupil often and give fresh impressions of the conditions needed in the hand for the action.

While the diminished seventh is being worked at, the octave is constantly practiced and the coördination for the trill in double-thirds is taught. The thirds are learned with the action from the elbow, the only form of mechanism for speed that has so far been established. No playing action of the finger is taught until there is an easy coördination established for octaves and chords, for if single tones are desired in order that the pupil may learn a melody to relieve the hard concentration on the technical problem, it is perfectly right that the tones should be played with this coördination, since all brilliance in the fully equipped technique is achieved with this mechanism. Brilliant double-thirds are always more easily attained with the action from the elbow than with finger-action. Of course, the greatest speed and smoothness will come when the finger-technique is established, as for the Chopin Étude in thirds, but a clear understanding of the two ways of playing the double-thirds easily shows the difference between the two techniques for speed: first with the action from the elbow and second with finger-action. Exactly the same elements of control are needed for double-thirds as for octaves, but there is the further complication that various fingers transmit the power, and in the necessary adjustment of the fingers to be ready for receiving the power of the arm, there is the temptation to allow them to make the actual playing movements also.

The difficulty in coördinating the finger-motions to secure quickness in adjusting two fingers to receive the power from the arm, brings forward the problem of creating a definite sensation of separateness of action in the fingers. A perfectly independent finger is considered a difficult part of the piano-technique. But when the five fingers are not asked to strike equal, independent blows, but only to be coördinated with the arm, so that all the dynamic power may be sent through any one of the five channels, or any combination of the five, the problem is greatly simplified. In my experience double-thirds solve this problem of coördination more quickly than any other approach, because they demand such

concentration to meet the requirements, and so audibly reveal a failure to act promptly and with exactness. So the problem of thirds at this stage is to keep the fingers inactive when the action from the elbow is being used, but to have a definite sensation that two fingers are especially chosen simultaneously to stand under the power of the arm.

The action of the palm in equalizing the five fingers in length must be established as a constant condition of the hand when the study of thirds is begun. Using the trill at the beginning of the Chopin Étude, Op. 25, No. 6, repeat the first pair of notes in the same manner that the repeated octave was learned: the shoulder furnishing the power, the playing action from the elbow, the palm controlling the spacing and equal length of the fingers and the fingers simply furnishing the channel for the power to flow through. Then repeat the second pair of fingers without losing the sensation that the first pair is still ready to receive power. This repeated action is easy up to the point when the number of repetitions becomes fewer, and the shift from one third to the next comes closer and closer together, as in the trill. It is a difficult problem in coördination, but, if closely analyzed and if the freshly renewed impressions of the separate conditions of coördinated action are frequent, it can be achieved quickly at moderate speed.

The diminished seventh should always be worked at until the palm acquires an easy feeling in the extension of the finger and the fingers can maintain their positions; and then, from the repeated action on one chord, the shoulder should be required to transfer the hand to another position of the same chord, without the hand, wrist or elbow doing anything in the transfer except continuing the motions demanded for the repeated action. The entire arm, directed by the shoulder, finds the new position. It is true that there is a slight difference in finger-spacing for different positions of the same chord, but in the diminished seventh—and that is why it is chosen—the positions are so similar that the emphasis should be placed on maintaining the position originally taken rather than on the slight change. In all the first work at the seventh chord, let accuracy of notes be subordinated, second to accuracy of sensation in the various procedures. Ease must come first and accuracy second.

This technique of shoulder, elbow and hand should be the only one used until familiarity with the keyboard and notes, and some

playing of pieces, has been achieved. Then only has the time arrived for training the fingers for their action of depressing the keys. At all times when, for a skip or chord taken from the shoulder, the hand leaves the keyboard, constant attention should be paid to seeing that the wrist does not start the action away from the keyboard. I place my hand on the wrist, and only when it is inactive, and only when the hand leaves because it is an extension of the lever acted upon at the elbow, is the up-action allowed. Over and over again, care must be taken for accuracy in this control. The principle that if one lever is in control of an action it is only waste to have superfluous activity in other levers, is carefully followed throughout the training.

The finger-action of extension has been given in Chapter Three. In presenting this action the teacher must clearly demonstrate for the student that the finger-action does not affect the constantly alert activity of the coördinated arm, or usurp any of the arm-motions. As before, I place my left hand on the student's shoulder, and this time my right hand goes under his palm, so that I can be confident that the coördinated control of the arm-power stands at attention from the shoulder to the first knuckle. I test its alertness by pushing up against the palm, and if wrist, elbow or shoulder yield to that pressure by relaxing control, I am sure that, when the finger is extended to the bottom of the key and the resistance of the key travels back against the first knuckle, there will not be the alert power of the arm at the knuckle to make the finger extension effective for tone. Often I place my hand on top of the student's to emphasize the fact that the knuckle is the place the finger bumps against when the key-bed is reached, and that there must be an active arm-power to furnish the dynamic energy for tone. The key returns to its position immediately if extension of the finger ceases as soon as the key-bed has been reached. There is no need for the finger to pull back, away from the key, but simply the need to stop producing the connection for tone, which is really what the function of the finger-action is. It extends to fill the gap in the connection between the arm-power at the first knuckle and the key-bed. The arm has accurately adjusted itself to the distance to the key-bed by silently depressing the key, and making the connection throughout the arm for the shortest line from the shoulder to the level of the bottom of the key. Then nothing changes in the entire arm, except that the fingers cease to maintain the line

for supporting the power; but when the fingers release that line to let the key come up, this release does not travel beyond the first knuckle; out to the first knuckle the power of the arm stands at attention. Only by covering the muscles of the hand and shoulder can the teacher quickly diagnose what has happened to make any of the coördination ineffective. In covering the student's muscles, if the teacher never uses a quick nervous pressure, but always keeps the touch like a feather and does not interfere with the action of the student, it is a simple matter for the student to be unhampered by the teacher's use of this technique. I also have found that this constant contact with the student, to ascertain what is happening, serves to keep the latter alert to meet the demands made upon him.

Scales and arpeggios remain to complete the fundamental coördinations for playing. For progression, the all-important point to be established at the outset is that the shoulder should lead the way. Therefore I must know what is happening, from the shoulder to the finger-tip. By taking the student's hand in both of mine, and placing my arm along the inside of his arm, I can cover all the muscles in action. I place the arm in playing position, see that the shoulder-power is adjusted to the key-bed level, and that in so doing there is no reaching for that level by the wrist or hand; and then I move the entire arm from a vertical position for attack on one key to a vertical position over the next key, and only after that movement is controlled at the shoulder do I allow the finger-action of extension to take place and tone to be produced. The thumb must learn to depress the key only after the vertical position over the key has been achieved, with the same accuracy as the other fingers; it is a more difficult coördination; for there is a slight movement of sidewise progression in the thumb when the shoulder seeks the key position, and there is every chance that the thumb will extend to find the key-bed at the same time that it moves slightly under the hand. I keep a very light contact with the muscles of the ball of the thumb until I am assured that there is no reaching for the position with the tip of the thumb, and no constriction at the wrist-joint caused by an exaggeration of the action for sidewise progression.

There is no greater time-saver in acquiring a fluent technique than accurately establishing this relation of the action of the finger in depressing the key to the action of the shoulder for finding

the position of the key. Therefore, at this step, infinite pains should be taken in teaching the playing coördination. Blocking the scales and arpeggios into chord-formation and quickly adjusting to the various positions is an efficient manner of establishing the shoulder action in relation to progression.

When the conditions and action for the execution of octaves, chords, the trill, scales and arpeggios have been given, the most difficult coördinations in playing technique have been taken care of. There remains simply the perfection of these coördinations throughout the years of learning the literature of the piano; but certainly these functions should be understood before playing begins, for then only does practice perfect the desired action of muscles.

The single trill is used for perfecting the finger-technique, because the trill is the most difficult coördination required of the fingers, and also because the single trill allows the most careful study of the mechanism. It is difficult to keep the relation of the shoulder-power and finger-action in a stationary position. When the instructor has succeeded in teaching the exact proportionate action of both, he may feel assured that the coördination will remain for the easier demands in the technique.

In explaining my teaching technique it is impossible to convey the amount of diagnosis that must be made by the ear. I make it a definite rule never to correct the student unless my ear has first detected some damaging influence upon his tone. The ear is the sole guide to the causes of waste and interference when the student is not a mere beginner. The eye should not be allowed to participate to any appreciable extent. With a listening ear and a knowledge of what the muscles should be doing, and with constant contact on the teacher's part with the student's muscles, the teacher has the best possible equipment for clearly interpreting faults and correcting them.

The ideal condition would be for each student to do only the right thing from the beginning, but every teacher should remember when he undertakes to change a technique, that the difficult coördinations of eyes, ears and muscles needed for playing which have already been established, form an excellent vantage-point from which to proceed to teach the greatest simplicity in the playing mechanism. It is always possible to make progress without attention being focused upon old faults.

When students come to the teacher hampered by inaccuracy and lack of ease, a diagnosis of the causes should reveal the points of emphasis for his teaching.

Two problems that must be met every day, in every piano studio, stand out in my mind. They are: first, how to achieve a suspended, traveling motive energy—an energy which flows directly from one attack to the next; second, how to achieve accuracy. The simplest solution of the first is the playing of a succession of notes as grace-notes or embellishments. The difference that the student hears between two equally important notes and grace-notes is that the grace-note and the principal note are played with only one application of power—the same impulse plays both—while the notes of equal importance stand out separately. If I want to convey the sensation that the whole phrase is to be played without disturbing the motive energy, I start by asking the student to play the first two notes as grace-notes, then to add one more grace-note in front of the principal note, until all the notes of the phrase are played as an embellishment in front of the last note. I have never failed in achieving my end by means of this simple method of conveying the difference between a flowing power and a power that is interrupted. As to the second problem, the simplest remedy for the correction of inaccuracies is adjusting to position on the keyboard, without tone.

The importance of these simple solutions has led me to the use of two stock questions which are asked of every pupil in my studio. What do you do to remedy an interrupted motive energy? The answer is, "Play the notes as grace-notes." What is your tool for remedying inaccuracies? "Adjust to the position on the keyboard, without tone."

When I have given the student such simple specific remedies for the correction of difficulties, I have given him tools with which to do his own building. It is always the aim of the efficient teacher to strive to make the student independent, and able to make his own criticism and correction.

CHAPTER VI

Illustrations from My Teaching Experience

A was a gifted mature musician, capable of playing the great literature of the piano with accuracy. He was conscious that, although he could get through things without blundering, it at times involved great effort and fatigue. He had gone to pianists of reputation to study, and had found that at the end of a year he was in exactly the same state as when he began. He had been given constructive criticism in interpretation, but never a constructive suggestion to rectify the faults which caused the undue effort. No attempt had been made to sift out his difficulties. He listened to the artists with understanding ears, and heard the result of perfect ease in their playing. He did not wish to be told exactly how to interpret a composition—he had ideas of his own as to that—but he wished to have fault found with his playing mechanism and to have it rectified. His playing was lacking in two fundamental factors: control of sidewise progression at the shoulder, and reaction against the first knuckle. When he felt the increase in ease as the shoulder took control of the placement of the hand and fingers, and heard the difference in the quality of tone produced when the arm furnished the power and the fingers furnished only the line for reaction, he knew his problems had been solved. The perfecting of the technique involved he was able to accomplish himself, for he had the faculty for self-criticism, and when he heard an artist, once he had found the clue to his production, he was able to make every concert a lesson for perfecting his own playing. Not all students possess the ability to criticize their own playing to the extent that *A* did, but every student would gain greatly in this respect if early in his studies he learned the artist mechanism, and was encouraged to use his own ideas in rectifying his playing.

B was a good example of a coördination process established without differentiation between the demands made on the large muscles of the arm and the small muscles of the hand. The hand did the work that the arm should have done, and as a consequence the arm did little at all. In spite of every faulty coördination *B* still had accuracy in striking the notes, because his ears demanded

accuracy; but correct notes were achieved with effort, and in difficult passages there was never freedom for emotional expression. These spots remained bad no matter how much they were practiced. This was bound to happen, of course, since he always practiced with a faulty muscular adjustment. All sensation of placement on the keyboard was at the tips of the fingers, and fatigue rapidly developed when the repetition of a difficult passage was demanded. Accuracy had been his chief concern. Very little thought or attention had been given to ease in production. Although no teacher could ask for a better equipment with regard to ears and muscular coördination than *B*, he had experienced little of the joy that comes from expressing in a flowing, easy manner his response to the beauty of the composition. He played the notes and that was about all. My first concern was to get into his consciousness the feeling of playing the piece from beginning to end with the control of a balanced power at the shoulder. For the time being accuracy was discarded as unimportant. He was made to sweep up and down the keyboard with attention concentrated entirely on the sensation of the steady current flowing from the shoulder. Then the finger-action was taken care of, and reaction established in place of the hitting process with the fingers; and the finger-spacing was taken into the palm instead of allowed to remain at the finger-tips, while continual attention was paid to the large muscles controlling the motive energy used.

When most of the playing technique of a student like *B* is concentrated in the hand, the forearm is usually disconnected from the shoulder-power. There must be a hooking-up throughout the arm, and control must be constantly sought for at the center of the radius of activity, the shoulder. For months the hand will revert to its old habits, the most persistent of which is reaching for the key. It is not safe to consider that habit obliterated. Rather always be on the watch for it, and take for granted that unless great care is observed some vestige of it remains.

I constantly hold up the ease of the jazz-player as an example of what the proper use of power in the large muscles will do for fluency. When this boy (*B*) was persuaded that his fingers were not half so bad as he had always believed, he gradually absorbed the idea that, after all, playing the piano was not such a complicated process, and that it might be two-thirds fun instead of seven-eighths hard work. The battle was won the minute that playing

became easy. The gifted student is always willing to wait for perfection, if only he finds that while traveling toward it he has some measure of emotional expression. When the large muscles are in control of both the motive energy and the sidewise progression along the keyboard, there is always the chance for the sweeping climax and easy flow of dynamics.

C had an extremely narrow hand, with unusually long, slender fingers. She had an octave span, but all chords were difficult for her, and large chords she considered impossible. The teachers to whom she went for assistance said, "You had better give up the playing idea and go into the teaching profession." She was gifted, had a passionate desire to play, and felt that she would have the ability to do so if only she were not restricted by her hand; but years of discouraging inability to conquer difficulties had persuaded her that the span of her hand was an insurmountable obstacle. Even when one thing after another had been rectified in my studio, her reaction was still, "Yes, I can do that now, but I can't do this other thing." At the end of six weeks of intensive study she had played without strain all the "impossible" places in compositions that had accumulated through her years of playing. I do not mean that a reflex command of the new coördinations was established in so short a time—probably old habits would interfere for months—but it was possible to solve all the difficulties, so that at the time there was a definite sensation of the actions needed to play without strain.

In her case the process was simply that of relieving the hand of all the action which belonged to the shoulder, and of gaining the fullest extension in the hand with the muscles which cause no constriction in the wrist and along the forearm.

Unless the student has unusual ability, this cannot be done in so short a space of time, but it can always ultimately be accomplished if the pupil be intelligent. It is only a matter of gaining the subtle sensations of action in the proper muscles and letting the others rest. When there is no such thing as differentiation in the functions asked of the hand and arm in a student's mechanism, it frequently takes some little time to educate his muscle sense. The hand is not the stumbling-block. If ability to play lies in the head, the hand can certainly be made into an efficient tool. A glance at the great variance in the hands of the artists who play bears out this statement. But in practically every case the woman pianist is

unable to rid herself of strain, once it has become habitual, unless she has a clear understanding of the exact muscular adjustment that is necessary.

D was an intelligent musician with an excellent teaching gift, but without any unusual talent for playing. She knew that her playing was neither easy nor beautiful, and that she could not always get the results that she desired from her students. She had tried various methods, but had never been given any direct answer to her questions of "How?" and "Why?" She was always receptive to suggestions, but nothing helped her to make the fundamental start toward rectifying her difficulties. She simply did not know what happened when playing was fluent and easy, and she knew that she did not know. It took weeks to establish a beginning in the explicit actions of the hand and arm. During each lesson many minutes had to be devoted to getting the hand into a condition of inactivity, so that a specific action could be registered. All the muscles worked at once when any action was asked for. Once the day arrived when inactivity could be maintained in all the muscles not in direct control of the action called for, the road was cleared for immediate progress. The problem, then, was simply one of learning the various conditions and actions that fitted into the complete adjustment for playing. Naturally, progress was much slower than it would have been had there been a differentiation from the start in the muscular action of the hand and arm.

E. There is a definite idea abroad that when a faulty technique has been used for years, the case is hopeless. The chances for improvement and correction seem so few that it is not worth the effort. But correction would involve far less effort than the effort that goes into every hour of playing or practicing with so taxing a technique.

In *E*'s mechanism there was so much strain that a few minutes at the piano produced severe pain between the shoulders and up into the neck, and any continued practice was impossible. Yet the desire to play was such a vital part of her being that it was not possible for her to give it up. She played professionally—had played for years—and had ability to achieve clarity and accuracy in spite of the effort involved. The muscles in her hand and arm stood out conspicuously from the demands for producing tone that had been made upon them. Then, to counteract the fatigue and strain, she had acquired the habit of relaxing between tones as

frequently as possible. There was that continual raising and lowering of the wrist and relaxing of the hand so common in the playing of women, and so conspicuously absent in the playing of men. In all her playing experience she had never produced a tone from the shoulder with a direct open channel to the key-bed, unless it were a small chord with less than an octave span. The hand, wrist and forearm all interfered, even when the power was started from the shoulder. She did not hope for relief, but she was interested in new impressions, and being a student her mind was as nimble as were her fingers. One octave scale produced without strain and with a vital quality was sufficient entirely to transform her attitude to the piano. When the new mechanism is simple and comfortable the still difficult task of discarding old habits is cheerfully and gladly undertaken. The pain disappeared from between her shoulders in less than two weeks. Every woman has ample power for an entirely adequate range in dynamics if all her power is conserved, but she cannot waste energy and still play easily.

Conclusion

"She was at her best in the light things," is a phrase I have met many times in the reviews of women's playing. It applies equally to all performers who build climaxes with effort and fatigue. It is an amazing fact that gifted students can watch the superlative ease of the men pianists who produce a beautiful tone and have unlimited speed, without realizing that they never use their *own* power simply. If they realize it and do not find the solution, then they should give up an attempt at public playing, for they will be forced to give it up later owing to the lack of an audience.

A performer may know harmonic structure and form, have a feeling for rhythm and dynamics, possess an emotional conception of the content of the music, have an attractive personality, and still fail to thrill his audience. Just as a body, perfect in all its organs except for the heart, gets out of order because of an insufficient blood-stream flowing to all its parts, so in music all the elements for beauty may be present, but without a vital current of energy constantly flowing through all the phrases no effective whole is presented to the listener.

There must be a constant vitalized energy produced by the large muscles acting upon the shoulder, which is undisturbed by the action of other muscles for speed in making contact with the key.

If, as many musicians think, technique is only a means to an end, it must be the technique of handling power, for without it there has never been a full outpouring of emotion.

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